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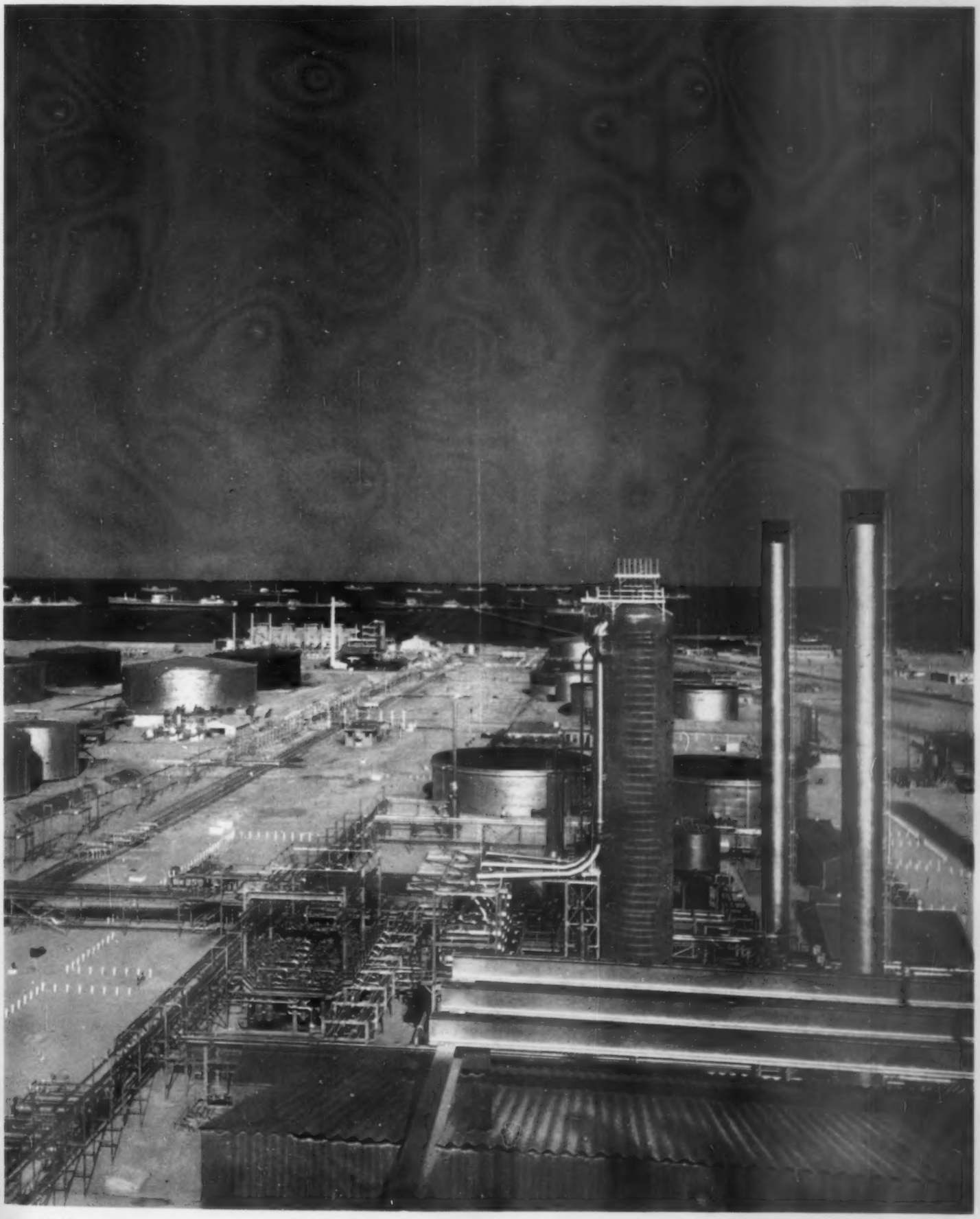

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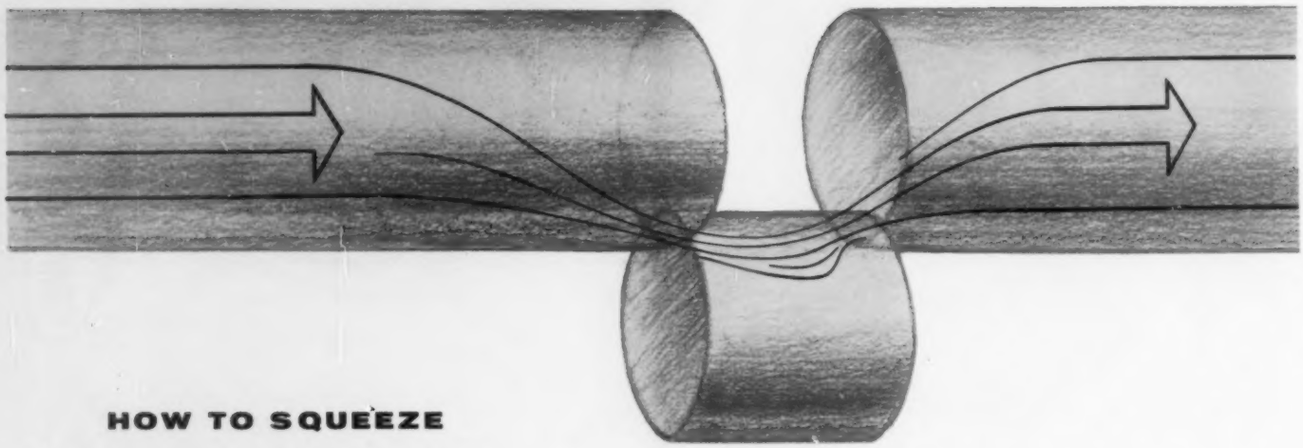
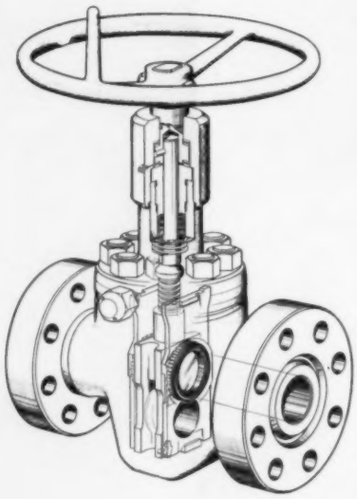


HOW TO SQUEEZE PRESSURE WITHOUT SQUEEZING PROFITS

Our illustration shows flow material in a valve as it would appear *without* the valve. This is the critical moment when the valve closes or opens. Notice how pressure and erosion are concentrated on one small part of the downstream sealing surface. In every valve except the Cameron Gate Valve this same small area is attacked each time the valve is opened or closed. Plug Valves, Ball Valves and other Gate Valves begin to lose pressure when this small portion of the sealing surface is worn away. In today's tough oil field services only thousandths of erosive wear can break the seal and squeeze profits instead of pressures.

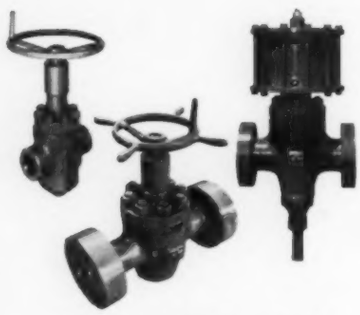
Downstream sealing surface on ordinary valves, notice small area which receives most erosion.

Downstream sealing surface on Cameron Gate Valve, the wear pattern changes with each operation.



Phantom view of Cameron Gate Valve showing double rotating seal rings.

But, in the Cameron Gate Valve (and only the Cameron Gate Valve) a new sealing surface is presented to the erosive blast each time the valve is operated. Valve life is increased tremendously — costs after purchase are greatly reduced. All of this makes the Cameron Gate Valve the least expensive valve in its class to operate — helps you put the squeeze where it belongs on pressure instead of profits.



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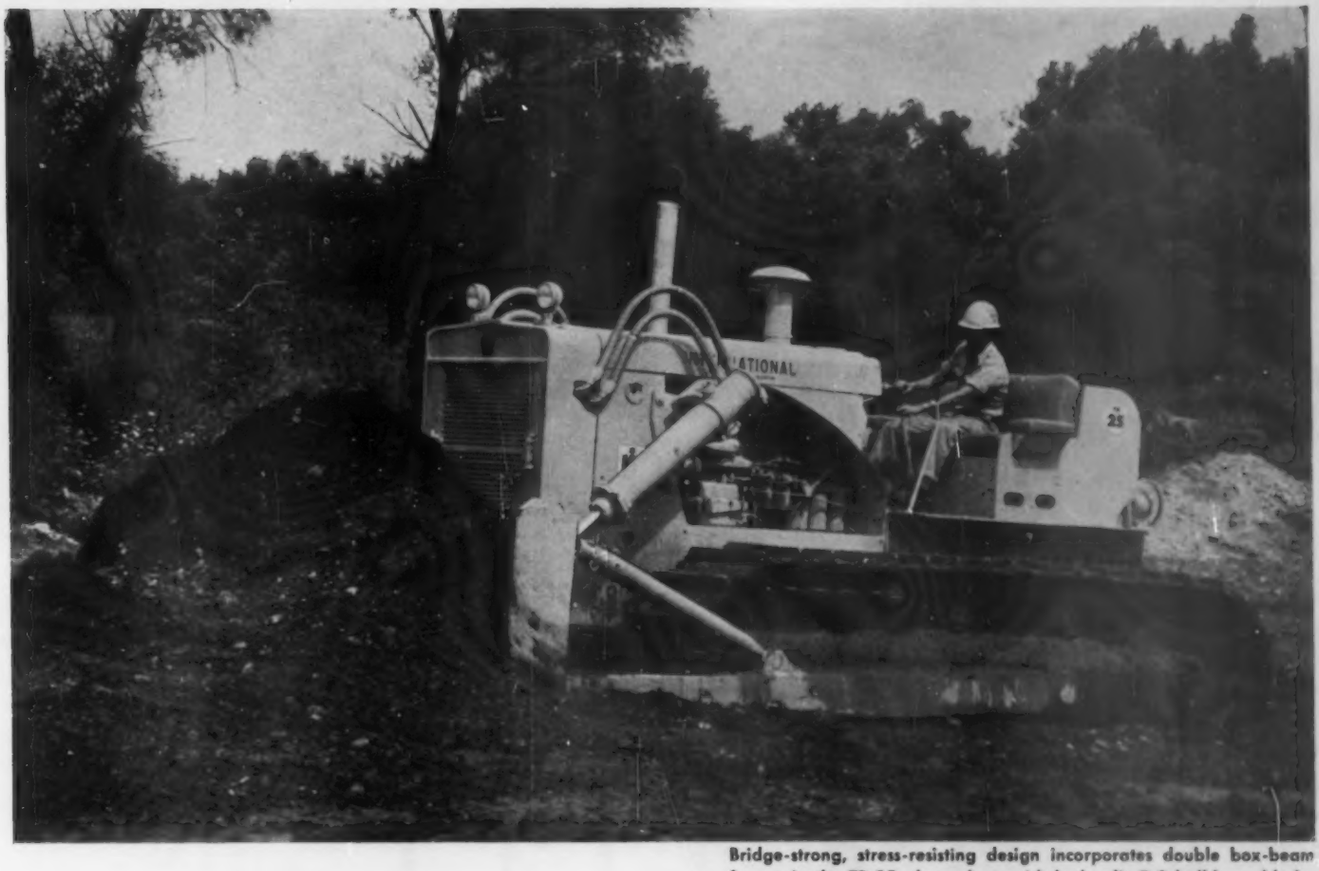

Bridge-strong, stress-resisting design incorporates double box-beam frames in the TD-25, shown here with hydraulic D-2 bulldozer blade.

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The TD-25's new International DT-817 turbocharged diesel engine is rated at 230 hp at only 1500 rpm (just 60% of its potential 385 hp) and has the reserve stamina to assure maximum output for continuous trouble-free operation. It's the same basic 6-cylinder engine used in International's biggest construction units—Payhaulers, Payscrapers and Paywagons. With DT-817 power, you can now standardize your big units, simplifying service and parts requirements.

The TD-25's fast power control with exclusive IH Planet Power steering and Hi-Lo power shifting increases payload capacity on the turns and reduces cycle time up to 50% over other equally powered, steering-clutch operated crawlers on a multitude of tough jobs. You get full-time live power on both tracks to make full-load turns every time.

Just press the direct-start button on a TD-25 on your next job and you'll move more yardage easier, faster and more profitably than you've ever done before. Ask your International Construction Equipment distributor for a demonstration soon.

Seven thick-shell track rollers insure long life with minimum maintenance. Here is the TD-25 with Model 260 rear cable control unit and D-3 front cable controlled bulldozer blade.

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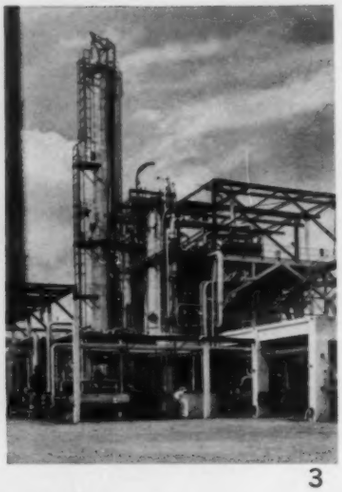

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THE MANAGEMENT PUBLICATION OF THE INTERNATIONAL PETROLEUM INDUSTRY

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THIS MONTH'S COVER

View of Kuwait Oil Co.'s busy south pier at Mina al Ahmadi with part of the company's 200,000-barrel refinery in the foreground. Color photograph was originally featured on the company's house magazine *The Kuwaiti* and is reproduced through the courtesy of Miss Margaret C. Clarke, of Kuwait Oil Co.'s public relations and liaison department.

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Washington

by Joseph B. Huttlinger

Little Oil Legislation Expected in '60

President Eisenhower's last regular session of the U.S. Congress has just reopened in the unique outlook that it may enact little major legislation affecting oil and gas. The domestic depletion allowance seems safe for the coming year at least, although foreign depletion will come under attack. Oil pipelines probably won't be divorced from oil refiners by action of Congress. The oil imports program seems set in its present form for another year or two. There is almost no chance of a natural gas bill as sought by the industry. Major oil companies will not be forced by legislation to get rid of the gasoline stations they own or operate.

What legislation is in sight is of a perfecting nature, such as on public lands leasing, or bills covering all industry, such as a labor bill. Antitrust bills are pending, including one to curb price discrimination and another asking advance notice of mergers, most of which are opposed by oil company officials. These bills had tough sledding in the past, and probably will in the year ahead.

Seeds that could lead to action in 1961, however, will be planted in the present session. The depletion allowance may be given full and formal study by the House Ways and Means committee. While Chairman Wilbur Mills, D., Ark., of the committee says the 27.5% rate of depletion is "absolutely justified" he has his staff studying this among other proposals. Mr. Mills has said the staff study will take a year, and the matter will be ready for committee hearings and action in 1961. When the committee goes into the rate of depletion, it probably will go into intangible drilling tax treatment and depletion for foreign oil operations. Mills has never endorsed the latter two.

Rep. James Roosevelt, D., Calif., son of the late President, is taking up a bill to forbid major oil companies from owning or operating gasoline stations and from making profits on tires, batteries and accessories sold at their outlets. Roosevelt has given up hope of action this year, but sees passage in years to come. He plans to drum up support by public hearings.

Coal industry leaders are pressing for a national fuels policy with an end use curbs on natural gas and oil in favor of oil. Coal leaders hope for action this year, but expect it only in 1961.

The oil and gas industry still is pressing for a bill to ease federal price and other controls over independent producers of natural gas. Leaders have abandoned hope for action in 1960, a national election year, but will lay the groundwork in the coming months for action in 1961.

The Federal Power Commission will hand down its decision in the current year in the test case of the Phillips Petroleum Co.,

Pipeline

and decide how much Phillips may charge for its gas in the field. This is the commission's first attempt to set rules under the price control powers it received from the U.S. Supreme Court.

Rogers Critical of Depletion Allowance

Attorney General William P. Rogers has supplied additional ammunition to foes of the income tax depletion allowance of 27.5% for oil and gas producers. In his fourth report on the Interstate Oil Compact, he says the tax provision is "a strong incentive for integrated companies to increase the posted price of crude where possible." Mr. Rogers also made these points about the tax allowance:

1. Depletion may be taken not only on production income but on income "from any sources whatever."
2. Depletion is allowed at the same rate regardless of the risks involved and risks can be cut where operations are widespread.
3. Thus, the 20 largest oil companies account for 23% of all domestic drilling, but only 10% of wildcat drilling.
4. Raising the posted price of crude by an integrated company would "enlarge the benefits of the depletion deduction and, hence, maximize the company's profit after taxes." But the independent refiner would be hurt.
5. Finally, the depletion is "a clear pressure" upon companies to secure their own oil rather than purchase crude.

The Rogers views, his first on depletion in the series of reports on the compact, represent the sharpest fault-finding with depletion from any member of the Eisenhower Cabinet.

Mr. Rogers covered also crude oil prices, the oil imports program, supply of crude oil and products and "the grave potential for control of crude oil markets" in the oil pipeline system.

He said crude oil prices used to go up and down, but that since the start of World War II they have only gone up. "This rigidity is remarkable" he said, particularly since oil has been in oversupply.

Mr. Rogers freed state conservation authorities of the blame for the price rigidity, saying it would be "impossible" for them to hold back production to keep up prices. He added that major oil companies through their pipelines are able "to frustrate the intended effect of an individual state's production policy."

On oil imports, Mr. Rogers became the first Cabinet official to say that the government's "surveillance" of the program is to watch for price "increases" not price decreases. If the price rises, he said, all the government can do is let in more oil.

Closest Rogers came to a suggestion for action lies in a summary covering, among other things, oil pipelines. He warned that owners of pipelines have the power to control crude oil markets, and said that antitrust cases can deal only with specific cases of abuse of this power.

The overall problem, he said, is "singularly suited to legislative action." He said any action by Congress must be based on "complete information" which can come only if oil and pipeline companies are compelled to furnish it.

(*Continued on page 6*)

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Rep. Emmanuel Celler, D., N.Y., has put in a bill to forbid shipper-owners of oil pipelines from receiving dividends on oil carried, which is close to a divorcement measure. Chairman Oren Harris, D., Ark., of the House Commerce committee, has set no hearings on the Celler bill.

Tax Book for Expatriates

A new book is available for U.S. citizens employed abroad most of whom are required to file Federal income tax returns, Internal Revenue Service has announced.

Copies of the "Tax Guide for U.S. Citizens Abroad" can be obtained without charge from the International Operations Division, Internal Revenue Service, Washington 25, D.C., from other offices of IRS, and from U.S. Embassies and Consulates.

Bureau of Mines 1960 Forecast

A rise of 3.9% in domestic demand for oil products faces the U.S. in the year ahead, according to a forecast of the U.S. Bureau of Mines. Exports of products will be 209,000 b/d and of crude oil 7,000 b/d, for a total demand of 10,080,000 b/d, up 3.8% from 1959. The exports represent a drop of 1.4%.

The forecast sees a rise of 3.2% in domestic demand for gasoline; of 4% for distillate; of 2.3% for residual and of 7.9% for all other products. It foresees a drop of 0.7% in demand for kerosene.

The bureau foresees U.S. crude oil production at 7,427,000 b/d, up 5.4% and production of other oils at 877,000 b/d, up 0.8%.

Crude oil imports are forecast at 975,000 b/d, up 1.5% and product imports at 824,000 b/d up 3.1%. Refinery runs are seen at 8,356,000 b/d, up 4.5%.

Oil Adequate for 40 Years

A study published by the Joint Economic Committee of Congress foresees adequate oil supplies for the U.S. during the next 40 years. The study is by Joseph L. Fisher and Edward Boorstein of Resources for the Future, Inc.

The paper estimates the 1960 U.S. demand for oil at 3.4 billion barrels. It estimates this will rise to 4.7 to 7.4 billion barrels by 1980 and to 17.9 billion barrels by the year 2000. This adds up to a 40-year demand ranging from a low of 190 billion barrels to a high of 350 billion barrels.

The paper estimates U.S. recoverable oil reserves at 90 to 200 billion barrels, but adds new technology may increase this. However, "sometime before the end of this century our natural oil resources may begin to be inadequate to meet the demand," the paper says. In any event, the decline would start well before exhaustion of reserves was reached. "Beginning sometime after 1975, there could be a significant and growing gap between the demand for oil and the capacity to meet it with domestic output," the paper says. "A large proportion of U.S. demand could be met with oil from abroad for a long time in the future." The total cost of producing and transporting such oil is "no higher and perhaps significantly lower than the cost of U.S. domestic oil." The authors suggest that if the U.S. became dependent upon foreign oil its bargaining position would become weaker, and it might have to pay a higher price.

Import Appeals Ruling

Oil Import Appeals Board has said loss of customers or making uneconomic purchases to retain them is no grounds for raising a company's oil product import quotas. The board so ruled in turning down an appeal of Standard Oil Co. (N.J.) to bring more residual oil and other finished products to Puerto Rico.

Jersey Standard had asked its residual quota be raised from 101,200 to 276,000 barrels and its quota for other finished products be raised from 19,136 to 149,000 barrels. Jersey said it was stuck with a low "base period" and that the quotas do not take into account the "growing demand for products" in the island.

Other companies are currently making a bitter protest against inequities they are suffering by being required to stand aside and make room for "newcomers".

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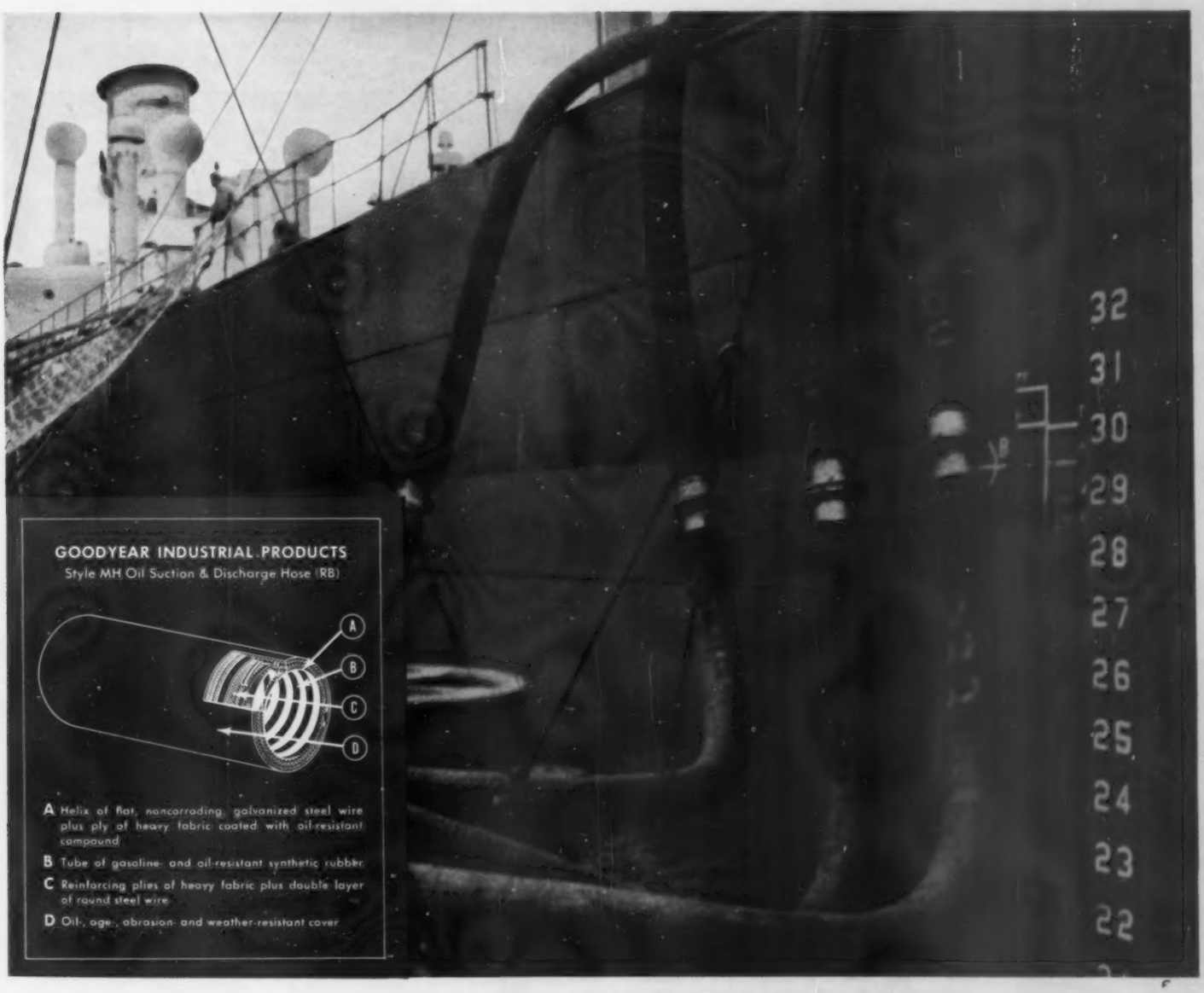

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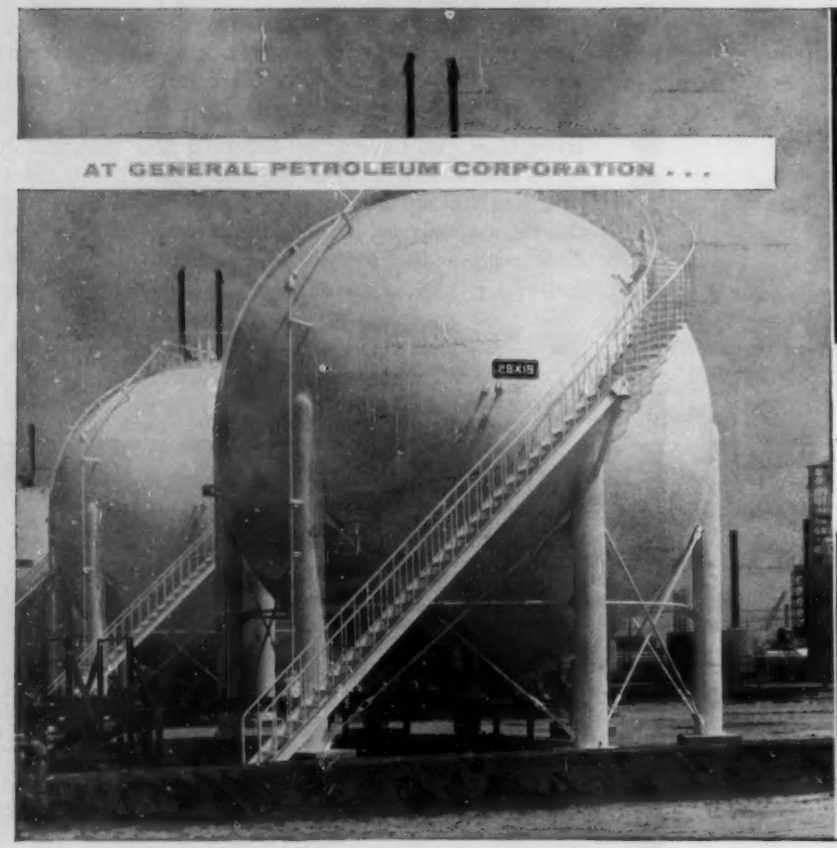

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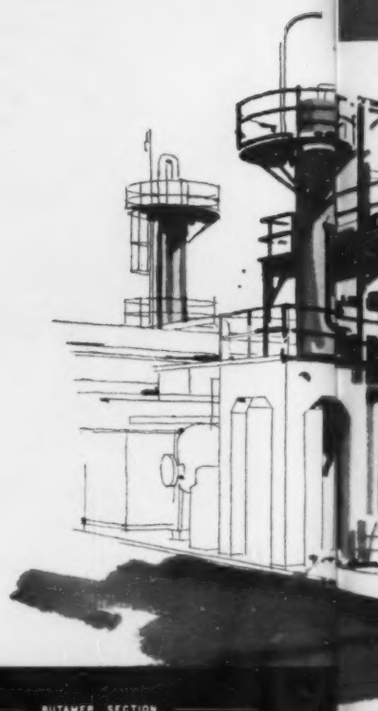

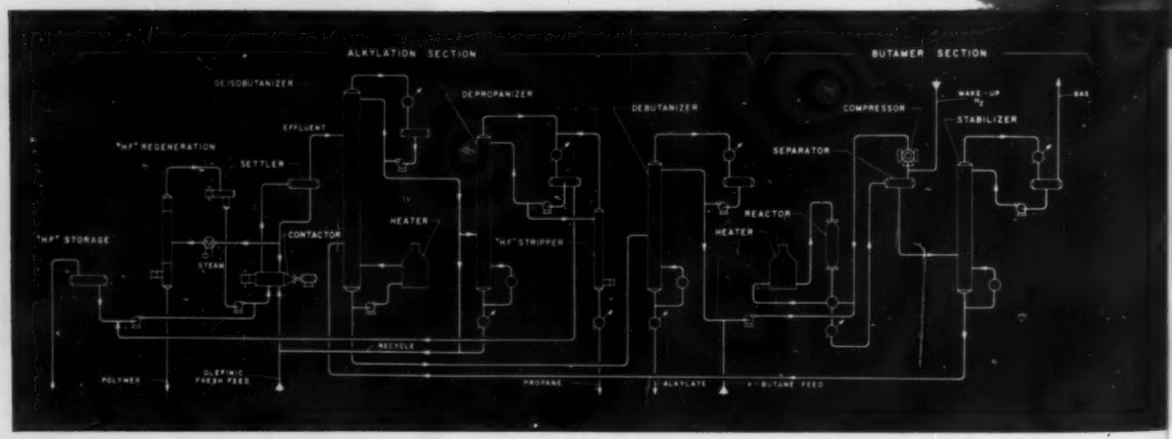

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LONDON LETTER

by Cecil W. Wood

Shell-Erinoid Agreements

January 1 saw termination of the agency agreement between Shell Chemical Co. and O. & M. Kleeman Ltd. whereby the latter's subsidiary—Erinoid Ltd.—marketed polystyrene made by Shell Chemical's associate Styrene Products Ltd. Further, Erinoid is no longer agent for the sale of Ziegler polyethylene manufactured by Shell but will continue to sell both its own manufactures and its own grades of polystyrene and polyethylene.

Shell Chemical is now marketing identical grades of polystyrene under the trade mark "Carinex" through its regional marketing organization, and continuing the marketing of "Carlona" high density polyethylene. The arrangements under which Styrene Products manufacture polystyrene for Kleestron Ltd., another Kleeman subsidiary, remain unchanged.

Avonmouth Oil Basin Improvement

A contract worth £936,000 for improving the oil basin at Avonmouth Docks, Bristol, has been awarded to John Laing & Son Ltd. This project involves the formation of a continuous reinforced concrete quay around the basin and the provision of a further tanker berth. Construction work started January 1, and is expected to take about 3½ years because of the necessity for avoiding interference with the daily work of one of the busiest oil ports in the country.

Expansion of Forth Chemicals

Forth Chemicals Ltd. is to expand its monomeric styrene plant capacity at Grangemouth from 30,000 to 50,000 tons per year to meet the increasing demand for use not only in polystyrene production but also in the manufacture of synthetic rubber, paints and resins. Completion is expected about the end of 1960. The company is owned two-thirds by British Hydrocarbon Chemicals (joint British Petroleum and Distillers subsidiary) and one-third by Monsanto Chemicals.

ICI Raises Solvent Plant Capacity

A major expansion of its trichloro-ethylene and perchloroethylene solvents plant at Castner Kellner works, Runcorn, was announced by Imperial Chemical Industries Ltd. This will raise the combined capacity for these two solvents by 25%—no actual figures are given—at a cost of £1 million. The addition will enable home market demand to be satisfied for several years ahead and permit an increase in export trade. It is hoped the extension, which will incorporate a new manufacturing process, will lead to lower production costs; meanwhile the prices of these solvents have been lowered 2% and 6% respectively.

UK Orders for Equipment

Orders for materials and equipment placed in the UK by oil companies in the first nine months of 1959 were valued at £83.2 million, according to details collected by the Oil Companies Materials Association. This was £6.3 million (7.1%) less than in the same 1958 period. The total for 1958 was £122.1 million.

It is the category covering "specialized equipment for oil refineries, etc. (excluding pumps and valves)" which shows the big decline over these periods—from £6.5 to £2.4 million. In fact, the 1959 quarterly average of only £0.8 million is the lowest since 1952 and compares with the peak quarterly of £2.0 million over the whole of 1958.

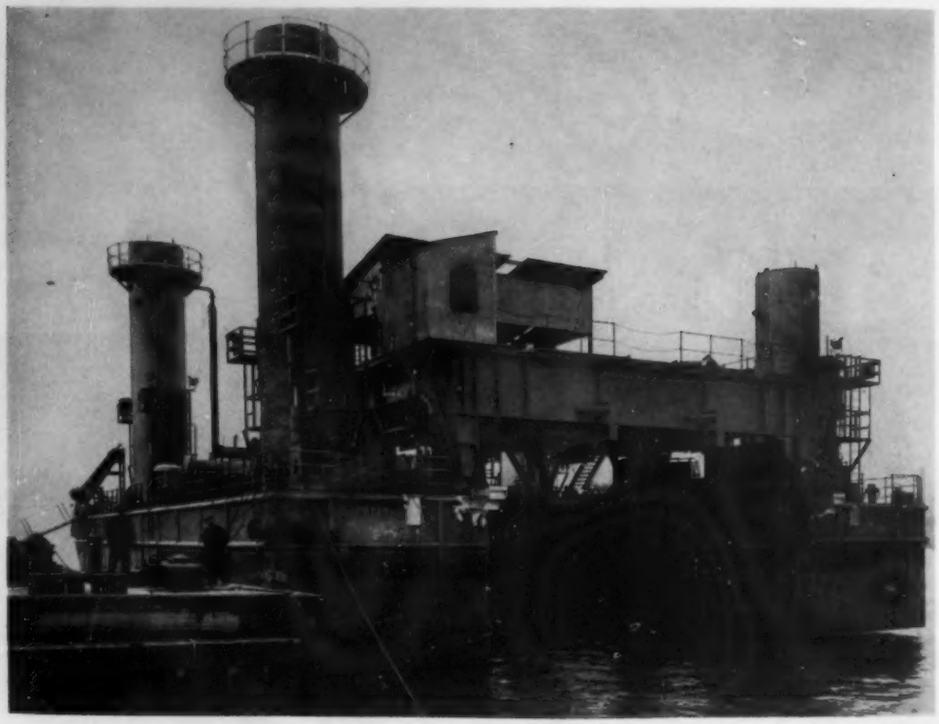
The largest categories in the 9-month 1959 period were as follows in £ million: chemicals, catalysts, etc., 16.9; tubulars, pipe fittings and valves, 8.8; specialized equipment for drilling and production (including casing and tubing), 7.9; automotive equipment, 7.7; machine and hand tools, etc., 6.8; drums, drumsheets and tinplate, 5.3; and commissary and general requisites for office and household use, etc., 5.2.

Process Controller to Germany

A large electronic control panel and desk for installation at B. P. Benzin und Petroleum's new 100,000 b/d refinery being built by Kellogg at Dinslaken (Germany) has recently been completed by Evershed & Vignoles Ltd., and was exhibitied before shipment at its Acton Lane works, London.

No less than 120 separate loops are required for processing control, yet these are accommodated in remarkably compact form. Reduction in operating personnel is aided by an interesting feature, the extensive use of "all-in scanners." In these any break in a clearly visible shadow line in the upper part of the panel indicates to the controller not only where conditions are abnormal but also the magnitude and direction of the deviation. An unusual feature is the provision of only two recorders for each panel (apart from those used for temperature measurement), each permitting the recording of plant parameters from 16 widely separated points by means of a simple plug-in selection system.

It is worth recalling that the Evershed electronic process control equipment installed for BP at Llandarcy in 1951 was the first such refinery application of electronics in the world. The maker's extensive plant experience and the developments in this field since then are incorporated in the Dinslaken installation.



New Shell Drilling Platforms

The second mobile drilling platform to be built for Shell International in the UK was due to leave the Tyne early in 1960 for Lake Maracaibo operations. This is named the "Triton," costing over £500,000 and built by Clelands Shipbuilding Co., Wallsend-on-Tyne, and designed by Bataafse engineers in conjunction with De Long Ltd., who, as main contractors, were responsible for engineering and supervision of construction.

The "Triton"—115 ft long, 80 ft wide and 15 ft deep—is capable of operating in water 120 ft deep and is designed to withstand 8-ft high waves and a 75 mph wind. The retractible legs are 200 ft long and 8 ft in diameter with 16-ft diameter footings to limit soil penetration. The hydraulic cylinders for operating the legs are powered by pumps driven by 60 hp electric motors drawing current from four 136 kw alternators.

Another Shell drilling platform—the "Seashell," built by NV Gusto Shipyard at Schiedam, Holland—was commissioned in December for operations about 50 miles off Qatar. This replaces a platform wrecked by storm three years ago. Shell has already spent £7½ million in underwater exploration in this area.

Appointments

Iraq, Basrah and Mosul Petroleum Companies announce the appointment of **N. M. EKSERDJIAN, N. Y. RUTH** and **L. R. MURPHY** as executive directors.

N. M. Ekserdjian joined the Gulbenkian interests in 1949 and as an alternate director of IPC and associated companies, representing Participations and Explorations Corp., acquired an intimate knowledge of the companies' affairs. He joined the management of the companies early 1959 and is responsible for relations with governments, concessionary matters and personnel policy. Nelson Y. Ruth joined the companies August 1959, with special responsibility for exploration and production. Prior to this, from 1954, he was concerned with Jersey Standard's worldwide production activities and was appointed a director of Jersey Production Research Co. on its organization in 1958. L. F. Murphy joined IPC and associated companies October 1959, with special responsibility for financial matters. From 1952 he was with Socony Mobil in London and in 1955 became chairman of Mobil Supply Co. and Mobil Shipping Co., and was also managing director of Mobil Services Co.

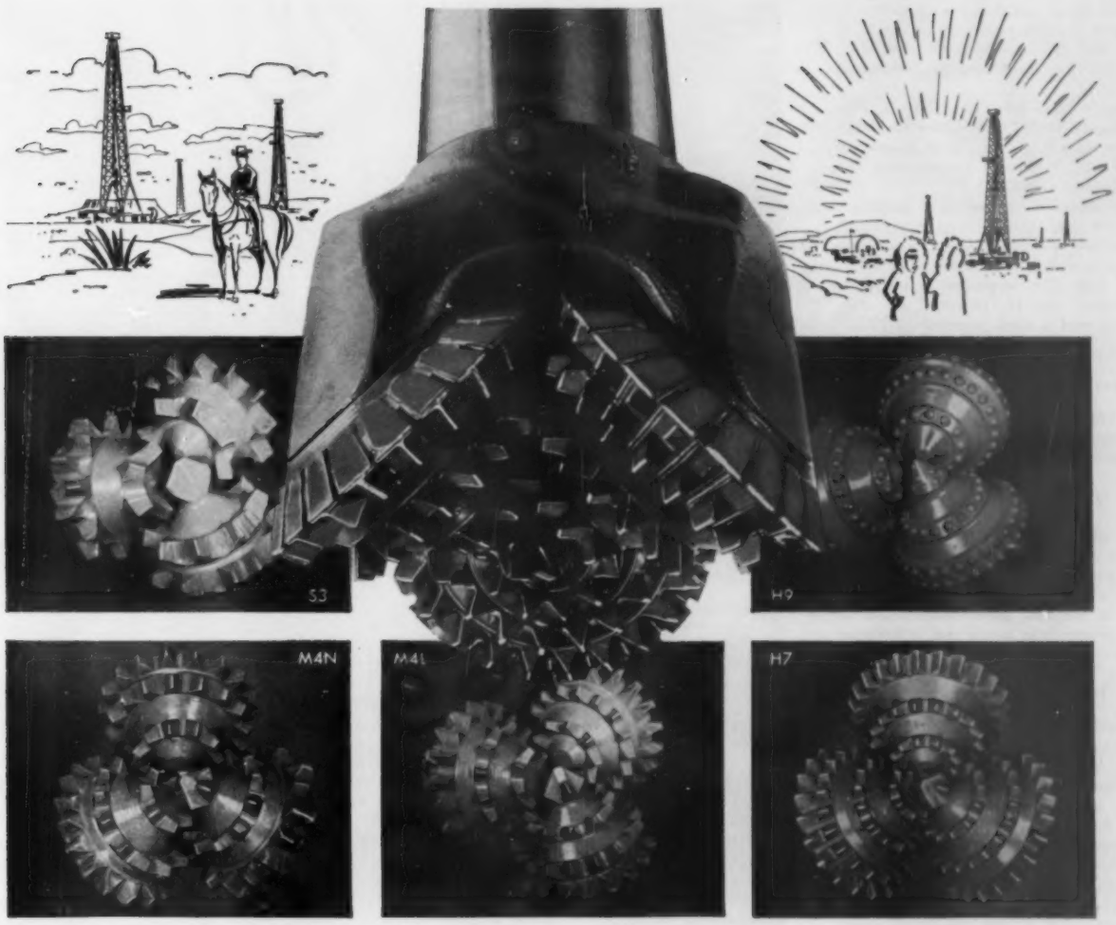
N. M. Ekserdjian

L. F. Murphy

A. H. SIMPSON has been appointed commercial manager of Woodfield Rochester Ltd., and will act as deputy to R. H. Corbett, director, in relation to the latter's sales responsibilities. Mr. Simpson was formerly general sales manager of Shaw-Petrie Ltd. and Clyde Tube Forgings Ltd. This appointment is part of the Woodfield group's development program to meet the considerable expansion envizaged in its activities.

A. H. Simpson

N. Y. Ruth



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CANADIAN NOTES

Pipeline Hearings Begin

Package hearings by Canada's National Energy Board into all applications associated with export of Alberta natural gas to markets primarily in the U. S. have raised hopes that the way will be cleared in Canada early in '60 for starts on the mammoth projects.

Applications include those of Trans-Canada Pipe Lines Ltd. and Niagara Gas Transmission Ltd.; Alberta and Southern Gas Co. Ltd., and Canadian-Montana Pipe Line Co., Westcoast Transmission Co. Ltd., and Alberta Natural Gas Co.

Niagara Gas Transmission has asked a certificate to construct a 12-inch line about 8½ miles in length connecting with the line of Trans-Canada near Cornwall, Ont., to connect with a line to be built by St. Lawrence Gas Co. Inc. Also sought is a license to export to St. Lawrence Gas 16,710 mmcf per day; 3,765 mmcf annually and a total quantity of 73,521 mmcf before 1980.

Arctic Farmout

Scurry-Rainbow Oil Ltd. has farmed out its interests in the Northwest Territories, involving approximately 3,500,000 acres, to Richfield Oil Corp.

Cut Lake Drilling

To cut down on oil pollution in the Great Lakes, the Energy Minister of Ontario, Macaulay, has said he will permit no more oil drilling in Lake Huron until at least 1961. He added that the Ontario Fuel Board regulations on gas and oil drilling would be completely revised before next spring and a decision made as to whether the drilling adds to pollution.

LPGas Pipeline Planned

Foothills Products Pipe Line of Calgary, Canada is considering construction of pipeline from the Calgary area to Milwaukee, Wisc., it is reported.

The line would cost $190 million, and would carry by-products of sour gas such as sulfur, propane and butane to the U. S. market.

One main question is whether to construct two lines or one. An attempt is being made to determine if sulfur could be carried in a slurry with the liquid petroleum gases carrying the sulfur. If so, only one pipeline would be required. If not, the liquid gases would be carried in one pipeline and the sulfur, in the form of liquid hydrogen sulfide in the other.

Trans Canada Plans

Trans-Canada Pipe Lines Ltd. is facing capital expenditure program of nearly $300 million in next three years. Acquisition of government-owned northern Ontario section of line will cost $130 million, probably in 1961. Loops and added compression facilities will be $161 million. New capital required is estimated at $263 million. The company expects to have a net loss in 1959, but will break even in 1960 if export is approved.

New Regent Refinery

Regent Refining (Canada) Ltd. has awarded contract for a new 4,700 b/d catalytic reforming unit at its Port Credit, Ontario refinery to Catalytic Construction of Canada Ltd. It will cost $1,500,000, go on stream September to replace a 2,000 b/d Platformer being converted to desulfurizing.

More Quebec Gas

Quebec Natural Gas Corp. will spend $44 million on new capital projects in the next four years, ending June 30, 1963, according to statement by L. Milano, executive vice president. It will create demand for $8 million of gas appliance sales a year, he said. Company will start to show net earnings in 1961, rising from $1 per share that year to $3 per share in 1963.

Well Completions Down

Only 194 wells finished drilling in western Canada in October, down 18% from October 1958. Cumulative completions for the first 10 months of 1959 were 2,066 wells, down 4% from 1958. Northern winter activity is counted on to sustain completions at higher rate in next four months.

Canadian refiners report that on completion of two major new eastern refineries next spring there will be 25% excess capacity above current demand. This is enough for three years' growth at present rate, and no new refineries are likely to be built in next two years.

Canada-U. S. Gas Treaty

A group of Canadian and American businessmen is pushing for a "treaty" or other "international agreement" to cover movement of natural gas to the United States. The Canadian-American Committee, a nonprofit group of business and labor leaders, says the treaty should be based on "four fundamental principles."

They include these: (A) Sufficient reserves should be set aside for each country, and the best way to have reserves is to give industry the incentive to explore for gas. (B) The exporting country must guarantee continuity of supply for a stated number of years, and must forbid "arbitrary interruption." (C) Starting prices for the gas trade should be those agreed upon by the exporters and the importers, and any changes later on should be based on the economic value to the consumers in the importing country. (D) By-products of gas production, such as crude oil, sulfur and natural gas liquids, should enjoy freedom of movement across the border.

Views of the committee become timely with the growth of gas projects to carry Canadian energy southward. A treaty might help resolve some of the difficulties in the way of gas movement at the present time.

CPA Optimistic

Only minor increases in markets for Western Canadian crude are expected in the new year—but the outlook for increased export of natural gas have kept forecasts for '60 from being pessimistic.

The Canadian Petroleum Association's General Manager John W. Proctor summed up the outlook as follows in a year-end statement and forecast: "There is no indication at present of any major increase in oil markets for Canadian producers who are in energetic competition with other oil producing countries in this present period of world oil surplus. However, 1960 should see a healthy growth in gathering systems, utility lines, cross country pipelines and other auxiliary services arising from anticipated export of natural gas. Investment in gas facilities should amount to $300,000,000 in the natural gas production industry and in addition to this about $150,000,000 will be spent on the construction of natural gas pipelines in Alberta alone if natural gas export permits currently before the National Energy Board receive government approval."

It was pointed out that Canadian oil producers' output is about 48% of the potential. For 1959 the average rate of production (when totals are in) likely will run just about 500,000 b/d. This may increase, at most, by about 10-11% in the year ahead.

1960 Markets Good

Industry forecasts all indicate product consumption in eastern Canada will increase between 6 and 7% in 1960 over 1959. Crude oil runs in refineries will be shifted more to Ontario, with 15% increase expected. Use of domestic crude may go up as much as 25% or 50,000 b/d, if refiners accelerate trend urged by Borden Royal Commission.

Gas Exports Up

The total of natural gas volume covered by export permit applications amounts to the equivalent of 150,000 b/d of crude oil, according to calculation by A. F. Campo, president of Canadian Petrofina Ltd., in a year-end review. This is 50% more than the 1959 average oil export volume.

Saskatchewan Gas Order

The Saskatchewan Government has imposed an order on gas processing plants in the southeastern fields, requiring them to sell gas exclusively to Saskatchewan Power Corp. Price has not been revealed but is said to be less than the 17½ cents per Mcf offered by Trans-Canada Pipe Lines Ltd. S. P. C. needs the gas for peak loads.

Canada's Production Up

Canadian crude oil production in January will mark new all time high estimated at more than 590,000 b/d. Alberta allowables cover nearly 440,000 b/d, Saskatchewan nominations over 132,000 b/d and other provinces estimated 22,000 b/d. This will be an increase of about 64,000 b/d over last January.

Personals

W. FRANK PRENDERGAST, assistant to the president (public relations) of Imperial Oil Ltd., retired Dec. 15, after 32 years of service.

ROBERT W. CAMPBELL, general manager of Home Oil Co. Ltd. has been appointed vice president and a director.

ALEX CLARK, vice president and director of Home Oil Co. has resigned to become president of The Calgary and Edmonton Corp. Ltd. He succeeds **E. A. NANTON,** retired. **GEORGE J. BLUNDUN,** Home's chief geophysicist, has been named exploration manager in which position he assumes responsibilities previously held by Mr. Clark.

GEORGE R. BROWN has been appointed assistant manager of the Texaco Exploration Co., Calgary, a wholly-owned subsidiary of Texaco Inc. He succeeds **ROY WHISENHUNT,** who has been transferred to Midland, Texas, to become assistant manager of the Midland division of the domestic producing department of Texaco Inc.

K. J. GOODING has been named merchandising manager in charge of Royalite Oil Co. Ltd. sales promotion, training; and tires, batteries and accessories sales. Mr. Gooding, who previously was area sales manager for Southern Saskatchewan, will make his headquarters in Calgary.

T. B. SMITH has been named superintendent of manufacturing for the Canadian division of the international department, Phillips Petroleum Co., with headquarters in Fort St. John, British Columbia, Canada. **H. N. OLSON** has succeeded Mr. Smith as superintendent of McMahon plant, jointly owned by Phillips and Pacific Petroleums, Ltd., at Fort St. John.

S. DOUGLAS TURNER of Calgary has been named general manager of the newly formed Big Inch Pipe Corp. Ltd.

Mr. Turner for the past four and one-half years has been the Alberta division manager of the Canadian Petroleum Association. He will administer the operation of the large-diameter pipe mill located at Calgary.

E. D. Loughney

S. D. Turner

EDWARD D. LOUGHNEY has been named president and chief executive officer of The British American Oil Co., succeeding **E. D. BROCKETT,** now executive vice president of Gulf Oil Corp., Pittsburgh, Pa.

P. E. L. LEGH-JONES, formerly assistant to the manager, marine transportation and supplies, Shell Oil Co., New York City, has returned to Calgary, Alta., in the new post of manager, area services department, exploration and production.

STEVE W. SHAMBAUGH, general manager of Reading and Bates Drilling Co. Ltd., has been elected president of the Canadian Association of Oilwell Drilling Contractors. He succeeds F. T. Glasscock, vice president, Pennant Drilling Co. Ltd. Elected vice president of CAODC was R. H. Bullied, general manager of Cascade Drilling Co. Ltd. New directors are William Booth, Commonwealth Drilling Co. Ltd., and Art Weibe, Regent Drilling Co. Ltd.

Here's the answer for a truly efficient, all-purpose bridge plug — one so simply constructed, with no moving parts, that it will not fail mechanically — so positive in sealing action that you get a leak-proof seal under hydrostatic pressures as high as 13,000 psi — yet so versatile it will successfully accomplish the most difficult plugging operations as well as the easiest.

The McCullough Bridge Plug is an explosive-expansion plug made of drillable aluminum. It is set at the desired location by the power of expanding gases from within the plug. On permanent installations it will last as long as the pipe in which it is set. It is ideal for temporary plugging operations as it drills out quickly and easily with a rotary bit.

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- No slips to hang up or accidentally trip and set the plug while going in the hole.
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- Drills out easier and faster.
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- Available in 37 sizes from 1¾" OD to 10¾" OD for tubing, drill pipe, casing and in open hole in hard formations.

VENEZUELA

A versatile oilfield service vessel, specializing in wireline operations, which soon will take to the rig-clogged waters of Lake Maracaibo. It will fly the colors of Fra-Sar de Venezuela. Stewart & Stevenson handled the entire project on a turn-key basis, including design and construction of the vessel's wireline unit.

Creole Beats Depth Record

A new drilling record has been established by Creole Petroleum Corp. in the Maracaibo Lake area with a depth of 16,051 ft. in well A-139-1 located in the northern part of the Lake. The former record of 15,995 was held by well 80-Z-IX of the Mene Grande Oil Co. in Ceuta field also in Maracaibo Lake.

Domestic Gasoline Consumption Up

Domestic gasoline consumption during the first nine months of 1959 increased 147 million liters, as compared to the same period in 1958, or an increase of 9%.

With the exception of ordinary gasoline, which has decreased 42 million liters, consumption of all other types of gasoline increased: 81-85 octane gasoline consumption has considerably increased during this period (154 million liters 43.6%). This is due to the increasing use of this type gasoline in high compression vehicles. 91-95 octane gasoline consumption has increased 23.5%, and aviation gasoline, 7.9%. Since September 1959 aviation gasoline is subject to a consumption tax.

Drilling In December

In the Maracaibo district, Compania Shell's well VLE-334 was drilled 150 meters from Block 17 (Phillips), reaching its final depth. Oil was found in the Eocene sands and drilling was discontinued until a rig is installed to complete the well as a producer of a single zone. Heavy equipment was transferred to the HQA location, 1,200 meters of the South where drilling of VLE-343 was started.

In the northwest corner of Block 7, Compania Shell completed testing well VLE-310 and suspended drilling. Shell began drilling of well VLE-344, which is located two locations east of VLE-310 and 700 meters from Block 10 of the San Jacinto concession.

In Block 1 (Venezuelan Sun), after completing well SVS-34 which resulted an excellent producer, the rig was moved to the L-8 location where another exploitation well will be drilled.

Creole commenced well B-538 which is located southwest of the Bachaquero field. This exploratory well (in depth) is a twin of well B-300 and 10,000 ft should be reached in order to investigate production possibilities in the Eocene sands.

At the end of the week exploratory wells being drilled were: PB-276, A-139-1, MGB-4X, 75-Y-4X, SLGX-12-3, SVS-35, and Centro 22X.

Barcelona District: Exploratory drilling continued at a normal rate. At the end of the month three exploratory rigs were in operation.

In the Zeta area, Mene Grande completed well Zacarias-1. This well is located 4 kms. northwest of Zanjas-1. It was drilled to a total depth of 14,964 ft and completed as a dual producer in the L-Superior and U-1 sands of the Officina formation. The fault which was expected to be found in drilling the Zacarias-1 was not encountered, and therefore it is believed that it extends to the proven area of Zanjas-Zapatos to the north. The well has not been completely evaluated, but the following results were obtained on short run tests:

Zone	Sand	Choke	BPD	GOR	Gravity API	BS&W
Upper	L-Upper	¼"	378	2,800	42.3	0.6%
Lower	U-1	¼"	594	2,200	42.7	4.0%

Mobil Oil Co.'s well, Quito-1, which is located approximately 20 kms. to the southwest of Valle de La Pascua, was drilled to a depth of 5,909 ft. Electrical logs taken indicated the presence of two sands in the La Pascua formation which may prove productive. A production drill will be used for testing.

Mobile commenced drilling of well Zamorena-1, which will be drilled to a depth of 5,520 ft. This well is located approximately 7.5 kms. south of Quito-1.

Maturin District: A new exploratory rig was active during the week. There are now 4 exploratory rigs in the district.

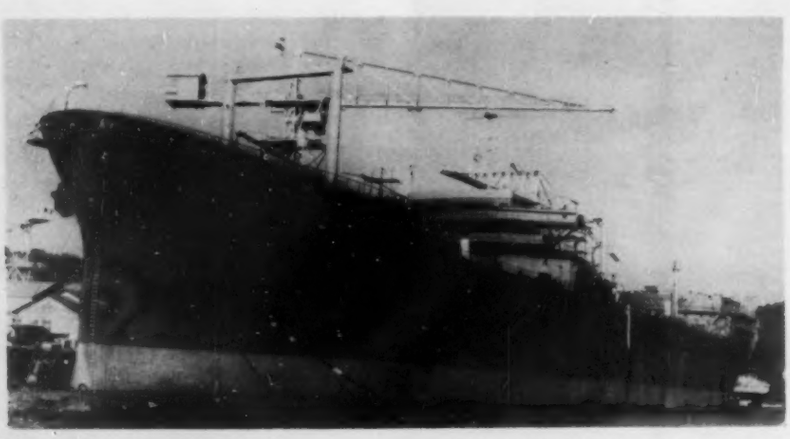
Pan-Venezuelan commenced drilling well Gopa-1 to evaluate their Gulf of Paria concession. This well is located approximately 27 kms. north of Posa-112-1. Total depth will be 10,000 ft.

Oil Envoy to Canada Named

Dr. Felix Rossi Guerrero of the Ministry of Mines and Hydrocarbons' Economic office has recently been appointed oil adviser to Venezuela's embassy in Canada. He is a former chief of the World Markets Division of the Ministry of Mines.

Shell Completes Maracaibo Terminal

A $35,000,000 new terminal recently completed by Shell of Venezuela has begun operations in the Maracaibo Lake area. The new terminal named "Puerto Miranda" is one of Venezuela's largest and will handle the bulk of Shell's production in the Western fields.



Creole Receives Supertanker

Creole Petroleum Corp. has received delivery of the "ESSO CARACAS," the second of four 46,550 ton supertankers built by the "Itachi Shipbuilding & Engineering Co. of Innoshima Japan. The modern supertanker is a sister ship of the "ESSO MARACAIBO" which was delivered on August 1958.

The new ship has a capacity of 296,000 barrels and is manned by an all-Venezuelan crew of 32 men. It will transport crude from the Maracaibo Lake fields to the refineries of Curacao and Aruba.

Industrial Lube Plant Tested

C. A. Nacional De Grasas has lubricants successfully commenced testing operations at its Valencia plant, thus marking initial industrial production of lubricating greases in the country. Capital invested in this company is totally Venezuelan ($1,050,000). The company announced that in 1960 they will be able to supply the Venezuelan market, and that they may also be able to export. Production capacity is 600,000 kilograms per month.

Natural Gas in 1959

During the period January-September 1959, 23,-997,226 cubic meters of gas were produced, or 3.78% above production for the same period 1958. 1959 production was distributed as follows: 29.64%, re-injection (oil recovery); 6.7%, consumption (subject to taxation), and 5.98% consumption (not subject to taxation); 55.96% was flared, and wastage was 1.72%. Consumption involves two items: Gas utilized by the companies for fuel, and gas sold to the public. 70.8% of these sales are made by four companies, and they are not taxed.

Total sales to the public for the period January-September 1959 were 16.23% more than for the same period 1958. This expansion is due to the new distribution facilities which have permitted greater utilization of gas in industry and for domestic use.

Venezuelan Counsellor in Canada

Dr. Félix P. Rossi Guerrero, of the division of economics, has been appointed counsellor on petroleum affairs to the Venezuelan Embassy in Canada. Dr. Guerrero is chief of the department of world markets in the petroleum economics division.

NEW PUBLICATIONS

Oil of Kuwait—Present and Future. By Samir Shamma. A monograph on Kuwait's oil problems, written by an Arab oil lawyer who has served for some time in the Saudi Arabian government. It is a discussion from the Arab point of view of the past, present and likely future situation in Kuwait. Chiefly interesting for its Arab viewpoint, which is too seldom heard. The author is well acquainted with the development of the Middle East's oil industry but seems less well based on technical aspects which are so vital to petroleum policy formulation. For example, he questions the value of the new repressuring plant, but repeats the often-heard view that natural gas should be used for petrochemicals in Kuwait. This is the same error the Venezuelan government made in erecting a petrochemical complex that cost nearly half a billion dollars and is almost completely useless. Someone should write a clear outline of the pitfalls awaiting the unwary petrochemical investor. 84 pages. Available for $8.00 from The Middle East Research and Publishing Office, P. O. Box 1224, Beirut, Lebanon.

RUSSIAN PATENTS GAZETTE. By Technical Information Co., Chancery House, Chancery Lane, London, W.C.2, England. A monthly review of Russian patents, abstracting each in about a paragraph. Available from the publisher as follows (subscription prices are annual): Russian Patents Gazette (Comprehensive) . . . $120. 2. General, Mechanical & Electrical Section only . . . $80. 3. Chemistry & Chemical Engineering Section only . . . $80.

Petroleum Products Handbook. Prepared by a staff of specialists, edited by Virgil B. Guthrie, formerly editor of Petroleum Processing and managing editor of *National Petroleum News.* 864 pages, 6 x 9. 459 illustrations and tables. McGraw-Hill. $18.50. A convenient reference to the methods, data, and working information for using petroleum products. Answers practical questions of concern to suppliers and users—ranging from transportation and storage to handling and actual applications. Thirty-two specialists cover in the handbook gasoline, diesel fuel oils, lubricating oils and greases, aircraft gas turbine fuels, distillate heating oils, liquified petroleum gas, and the other important petroleum products.

"The Persian Gulf States" by Sir Rupert Hay, (Middle East Institute, Washington, D. C., 1959, 174 pages, $3.75). A useful guide to the details of British administration in the Persian Gulf, and a basic work for those concerned with the area.

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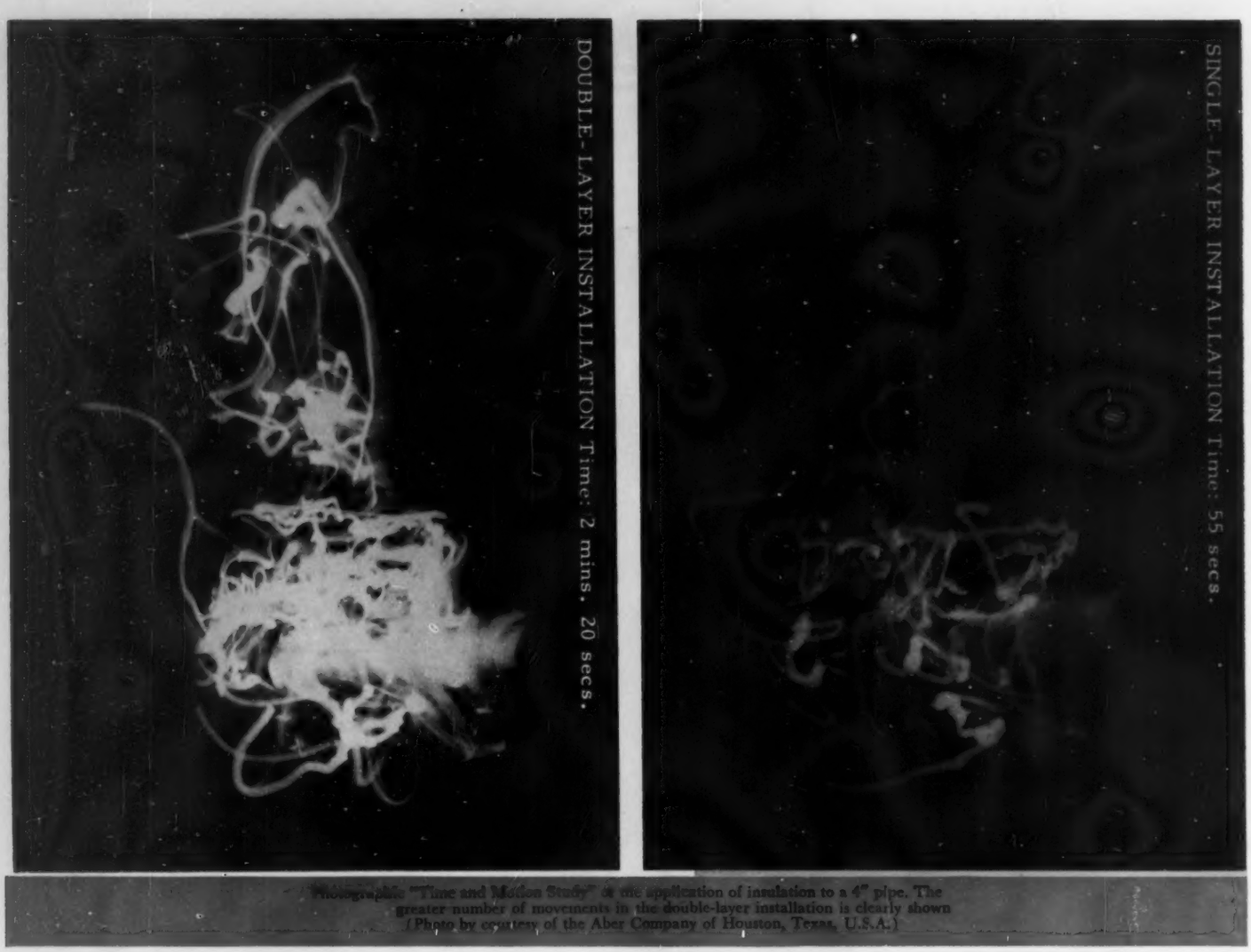

Photographic "Time and Motion Study" of the application of insulation to a 4" pipe. The greater number of movements in the double-layer installation is clearly shown (Photo by courtesy of the Aber Company of Houston, Texas, U.S.A.)

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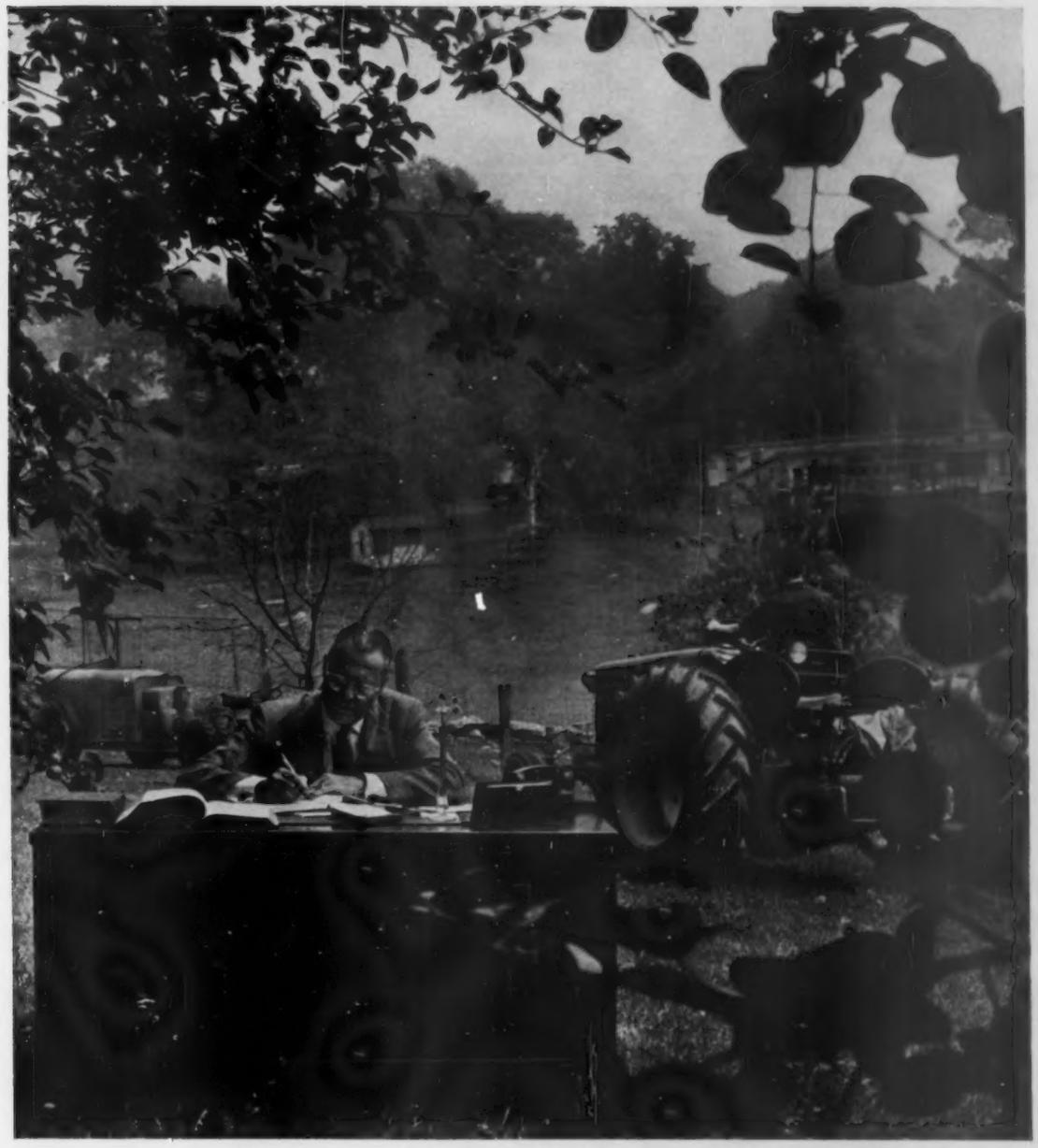

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SHELL OIL COMPANY

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WORLD PROCESSING REVIEW

By Wm. C. Uhl, Processing Editor

Highlights of the month—Better techniques in feed preparation help improve economics of catalytic cracking, liquefied petroleum gas boom continues, the refinery of tomorrow, new compact cars are posting record-breaking sales in the USA markets

A substantial improvement in the economics of catalytic cracking operations can be achieved by careful attention to feed preparation and to specific contaminants in the feedstock. This was brought out in a number of reports made by USA, Canadian, and British oil companies as well as two major engineering concerns at a symposium on this problem during the 52nd annual meeting of the American Institute of Chemical Engineers in San Francisco in December.

Among feed preparation techniques discussed were the Gulf HDS process; a system used by Humble including propane deasphalting, hydrodesulfurization and phenol extraction; a propane deasphalting process utilizing rotating disc contactors; furfural refining as practiced by Texaco, and phenol extraction in a centrifugal extractor.

Among feedstock variables whose properties affect cracking operations and on which reports were made: metal poisoning and feedstock boiling range.

By means of HDS processing at 2,000-3,000 psig, Gulf Research and Development Co.'s Harold Beuther and Richard A. Flinn said it is possible to convert atmospheric and vacuum residues to high quality catalytic cracking charge stocks. Hydrogenation reduces nitrogen and metals contents to acceptable levels and subsequent cracking of the hydrogenated residues showed them to be equal or superior to virgin gas oils in most respects.

It is possible to eliminate completely residual fuel production by use of HDS and catalytic cracking. Economically, the process becomes competitive with more conventional methods, such as thermal visbreaking, as the price of No. 6 fuel oil declines relative to crude and distillate products prices. In an economic study on comparative economics, the Gulf men used a refinery scheme for processing 100,000 b/cd of a Kuwait crude. Under conditions of present prices and manufacturing costs, where a scheme including visbreaking would show a payout of eight years (after income taxes), one including HDS would have a payout of about 8.6 years. However, as the price of No. 6 fuel oil decreases, economics tend to favor the HDS route; the break point where both processes are about equivalent is when No. 6 price is around $2.20/bbl.

In the operating sequence Humble has been using at its Baytown, Tex., refinery to prepare catalytic cracking feeds, the virgin feeds and recycle stocks are processed separately in a system including vacuum distillation, deasphalting, hydrodesulfurization, and phenol extraction. The manner in which these various steps have been integrated into the operating scheme is illustrated in the simplified flow chart, Fig. 1. In addition, the company modified its deasphalting tower to increase removal of metals and of aromatics from the feed to the cat cracker.

The modification involves primarily the use of a "wash oil" as well as the propane solvent; the wash oil consisting of very high boiling aromatic polymers derived from vacuum distillation of heavy catalytic cycle stock. The wash contacts the upflowing solvent-rich phase and flows down the tower, countercurrent to the process stream. Because of its affinity for metallic components, this aromatic wash removes an additional 60% of heavy metals from a fixed yield of deasphalted oil, Humble's K. K. McMillin reported.

Deasphalting unit overhead joins vacuum gas oil and flows through the hydrodesulfurization unit before being charged to the cat cracker in substantially sulfur-free form and with more of the heavy metals removed. Humble estimates the cost of the hydrogen in its hydrotreater at about 5¢ per mcf based on its alternate disposition as fuel; it is by-product hydrogen from the catalytic reformer. Principal effects of the hydrotreater on catalytic cracking are a boost in yield of premium grade motor fuel, a reduction in residual fuel oil, and savings in maintenance and operating cost in the product finishing phase of plant operations.

The phenol extraction used on catalytic recycle stock at Baytown produces a raffinate which is actually superior to virgin gas oil in its cracking characteristics, Mr. McMillin said.

Attractive economic advantages can be obtained by using propane deasphalting on vacuum residues with the application of rotating disc contactors, reported John Ditman of Foster Wheeler Corp. In calculations based on a typical modern refinery processing 100,000 b/cd of Arabian, or similar, crude oil, he reported that regular gasoline yield can be raised from 25,617 to 26,960 b/cd; light cat cycle oil from 2,707 to 6,636 b/cd; and No. 6 fuel oil yield reduced from 12,473 to 6,704 b/cd.

Payout would vary with specific costs and product prices of course, but the Foster Wheeler report estimated that an 11,000 b/cd propane deasphalting unit with an initial investment cost of about $3.2 million would pay out in about 1.2 years before taxes and depreciation, based on the following realizations for the specific products; regular gasoline, $4.62/bbl, and No. 6 fuel oil, $1.85/bbl.

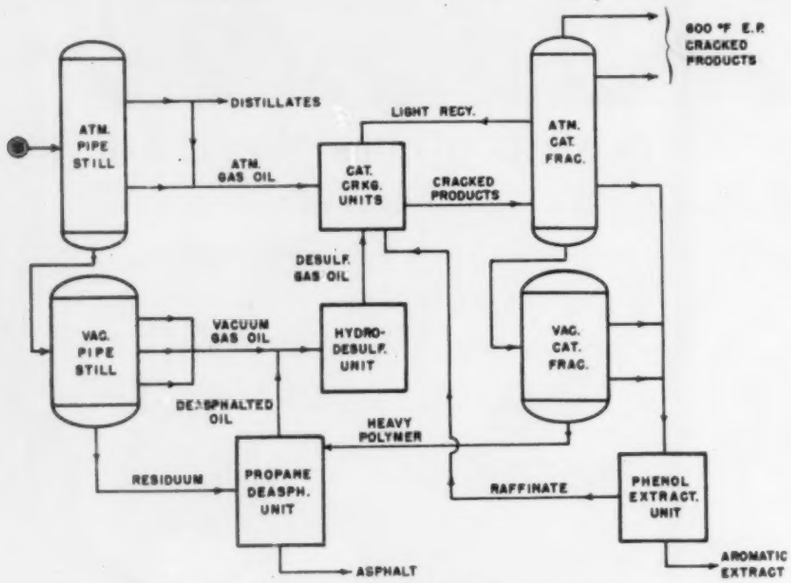

FIG. 1—Humble Oil's catalytic cracking feed preparation system.

Furfural refining is used by Texaco on virgin, deasphalted and cycle gas oils. The AIChE paper by R. R. Dickinson and C. B. Longworth pointed out that its units at two different refineries have been in commercial operation for periods of four and ten years. At the Eagle Point Works in Westville, N. J., a packed tower has been used; at Los Angeles centrifugal contactors are being employed.

Among a number of specific advantages for furfural refining, Texaco said, are these:

(1) Greater selectivity for aromatic fractions, sulfur, nitrogen, and carbon producing and metal bearing components.

(2) Good capacity, allowing use of relatively small amounts of solvents.

(3) Volatility and azeotropic characteristics which allow easy recovery by distillation from oils boiling above 400 F.

(4) Low solubility of the solvent in the paraffinic raffinate phase—generally about 5 to 10 vol-%.

(5) A specific gravity differential compared with many oils that permits easy separation into two phases.

(6) Relatively high miscibility temperature with most oils, which allows extraction temperatures above the wax crystallization point and in a range in which the viscosity of the oil treated is low.

(7) Reasonable cost and adaptability to a wide range of oils.

(8) Low freezing point, chemically unreactive with oil components, and good storage stability.

Favorable economics for phenol extraction of virgin feedstocks was reported by P. T. Atteridg and R. P. Cox of M. W. Kellogg. In their studies, petroleum fractions were prepared in the same yield (crude basis) by decarbonizing only and by decarbonizing plus phenol extraction. The superior quality of the phenol raffinates was reflected in production of 7 to 10% more gasoline (basis cracking charge) when catalytically cracked at the same carbon yield. A unit for somewhat milder phenol treating will pay for itself in about two years after taxes, the Kellogg engineers said.

Average boiling point of the feed can be used to predict several important results, according to R. L. Flanders, J. G. Girard, and B. D. Laughlin of California Research Corp.; and these are conversion and the major products of conversion, gasoline octanes, and gas composition. They found that cat cracking product yields and qualities are greatly influenced by the feed boiling range and that for the most important yields and qualities, an average boiling point is all that is needed.

Low boiling feed is refractory, but cracks to high quality gasoline. High boiling feed cracks readily, producing large quantities of relatively low quality.

Recycle boiling range is also an important process variable to be used by the catalytic cracking plant operator. As with fresh feed, the higher it is, the more readily the stock will crack. Products obtained in recycle cracking are also influenced by recycle feed boiling range. High boiling recycle stock makes more coke than does low boiling cycle oil. The other conversion products are less influenced by the volatility of the recycle stream.

A reliable guide to the extent of metal poisoning of cracking catalyst by measuring the rate of hydrogen production in a Fluid unit was reported by E. C. Gossett of Sinclair Research Laboratories. He said that the hydrogen producing factor—a ratio of the mol % of hydrogen to the mol % methane, ethane and ethylene—because of its high sensitivity to changing metal contents, can provide the operator with a guide by which to adjust catalyst makeup rates or select feedstocks. The Sinclair studies did not involve conventional, artificial methods of poisoning the catalyst; instead normal feedstocks containing as much as 50 ppm pg nickel oxide were used to poison samples of the catalyst used in the laboratory tests.

A mathematical approach to predicting yield and product quality of catalytic cracking operations was reported by H. E. Reif, R. F. Kress, and J. S. Smith of Sun Oil Co., in which equations were developed which relate these results with the physical and chemical properties of the feedstock. The equations were derived from pilot plant data obtained from a wide variety of charge stocks including virgin distillates, coker gas oils, extracts, and raffinates.

The properties found to be significant were: mean average boiling point, carbon type distribution, naphtha in the charge, and the concentrations of total sulfur and basic nitrogen. Sun's engineers said these

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TABLE 1—MARKETED PRODUCTION OF LP-GAS, USA
(in millions of gallons)

	TOTAL		DOMESTIC AND COMMERCIAL (1)		MOTOR FUEL		INDUSTRIAL AND MISCELLANEOUS		GAS MANUFACTURING		CHEMICAL MANUFACTURING		RUBBER COMPONENTS	
YEAR	Volume	Yearly Increase	Volume	Yearly Increase	Volume	Yearly Increase	Volume	Yearly Increase	Volume	Yearly Increase	Volume	Yearly Increase	Volume	Yearly Increase
1925	0.4	7.2 %												
1930	18	81.4	12	100.0 %			2	46.7 %	4	60.0 %				
1935	77	36.2	21	20.9			48	47.6	8	20.4				
1940	313	40.2	134	53.1			124	32.8	20	31.4	35	29.0 %		
1945	1,277	20.4	533	19.7			257	0.8	54	17.4	224	47.5	209	28.8 %
1950	3,483	22.8	2,022	24.3	130 (2)		226	33.4	252	5.2	624	14.6	228	28.5
1951	4,227	21.4	2,167	7.1	290	123.4 %	269	19.4	282	11.9	845	35.2	375	64.1
1952	4,477	5.9	2,266	4.6	371	27.8	339	25.8	260	-7.8	871	3.1	371	-1.0
1953	4,932	10.2	2,479	9.4	498	34.5	374	10.4	222	-14.4	967	11.1	391	5.3
1954	5,126	3.9	2,627	6.0	547	9.8	402	7.3	192	-13.7	1,050	8.6	308	-21.2
1955	6,123	19.5	2,801	6.6	652	19.1	556 (3)	38.5	214	11.4	1,493 (4)	42.2	406	32.0
1956	6,636	8.4	3,001	7.1	773	18.7	630	13.3	212	-0.7	1,601	7.2	418	2.9
1957	6,939	4.6	3,067	2.2	805	4.1	685 (5)	8.7	231	8.9	1,732	8.2	418	0.0
1958	7,462	7.5	3,294	7.4	852	5.9	806	17.7	239	3.4	1,899	9.6	372	-11.1
1959	8,693	16.5	3,604	9.4	937	10.0	1,020	26.5	245	2.6	2,396	26.2	491	32.0

(1) Householeating and other household and farm uses. Included also is LP-Gas sold by domestic distributors but used for commercial or industrial purposes.
(2) For all years prior to 1950 the Motor Fuel volumes are included in the Industrial and Miscellaneous volumes.
(3) Includes more complete coverage of refinery fuel.
(4) Includes more complete coverage of LPG mixture streams containing ethane and methane.
(5) Includes volume used in secondary recovery of petroleum.

REMARKS: In this table total sales for all years except 1959 were obtained from U. S. Bureau of Mines reports. Distribution for the years 1935 to 1958 inclusive, was obtained from the same source. All other volumes were estimated by the writers. The total sales volume includes all LP-Gas (propane, butane, and propane—butane mixtures) when sold as such. Until 1944 the sale of pentane when sold for any purpose other than motor fuel blending was included. Since then it has been excluded. It does not include LP-Gases when blended or otherwise used (e. g. by alkylation) in the manufacture of gasoline. Intercompany sales transactions such as purchases of LP-Gas by one company from other companies and resold as LP-Gas have been eliminated in order to avoid duplication of sales figures.

equations can be used to predict cracked product yields and F-1 clear and leaded octane numbers of the catalytic gasoline at constant reactor conditions for charge stocks based on laboratory tests.

As a result, costly pilot plant evaluations can be minimized. Through the use of the equations the effect of changes in individual charge properties—such as boiling range, carbon type distribution, and non-hydrocarbon content—can be predicted.

A continued boom in liquefied petroleum gas in the USA was indicated in the annual year-end review of the LPG industry prepared by Phillips Petroleum Co.'s George R. Benz, W. F. DeVoe and Paul W. Tucker, and released at the end of December. Sales in 1959 rose 16.5% over 1958, to a total of 8,693 million gallons. Marketed production for 1959 and the previous 14 years are given in Table 1.

The increasing market for petrochemicals was reflected in the increase of 26.2% in sales of LPG as a raw material for chemicals manufacture. And this does not include LPG in the manufacture of synthetic rubber, which jumped 32% over 1958. These two outlets accounted for a total of 2,887 million gallons, more than one-third of the total LPG market.

Sales of LPG for domestic and commercial uses are estimated at 3,604 million gallons, 9.4% above 1958. Although this continues to be the largest single market, the percentage of overall sales has dropped to 41.5%.

Sales for motor fuel uses increased 10%, to 937 million gallons, with the largest volume again for use in farm tractors. The use of LPG in industrial trucks (off-the-road type) continues at a faster rate than any other motor fuel uses.

In the industrial and miscellaneous category, the increase was 26.5%, to a total of 1,020 million gallons, and the large factor was greater use as a refinery fuel. Although the extension of natural gas pipe lines has caused displacement of LPG in some geographical areas, the overall effect has been to stimulate interest in both LPG and natural gas.

A thoroughly imaginative yet solidly down-to-earth description of the refinery of tomorrow was set forth by Sun Oil Co.'s manufacturing vice president Clarence H. Thayer in a talk at the annual meeting of the American Society of Mechanical Engineers in Atlantic City in December. Among the highlights of his remarks:

The refinery unit of the future will have to be able to remain in continuous operation for four or five years. Mr. Thayer pointed out that today most operators are content with a shutdown time of 3 to 7%, yet with narrow profit margins and maintenance costs so high, it may take as much as six months or more of profits just to pay for the shutdown.

Not only must the time interval between turnarounds be stretched, he added, but also the time interval during turnarounds must be compressed. He foresees an opportunity for equipment manufacturers to develop more packaged equipment of many types. Batteries of pumps, of heat exchangers, furnaces, even piped-up fractionators, are all in the realm of possibility, he said. Such equipment, constructed in interchangeable units, would permit entire processing sections to be pulled out and immediately replaced during a shutdown. Sun itself has for five years used standard, interchangeable condenser units to help reduce downtime.

In addition, shop fabrication of packaged components on an assembly line basis would be far less costly than field erection, and would therefore contribute also to lower initial costs. And if costs were low enough, refiners could afford to build smaller units in many cases, thus effecting savings in product transportation costs by having more plants closer to good markets.

Another area in which the future can and should bring great improvements, Mr. Thayer pointed out, is in instrumentation. He said:

"It is curious to me that I can control my TV set with a gadget that operates without any direct interconnection, and yet a highly instrumented refinery unit requires a tremendous, and needless to say expensive, maze of wires and air lines to link the various parts of the control system. One little fire with the destruction of instrument connectors and leads and you are out of business for a week or a month. Surely the computer control of the future will issue its orders directly to the final control elements by a wireless and pipeless system, such as microwave carrier or a directed ultrasonic beam . . ."

The primary reason for this needed, and anticipated, future trend is in the rising costs in relationship to product selling price, Mr. Thayer emphasized. In the 45 years since he first went on an oil company payroll, he pointed out that industrial construction costs have risen 790%, the cost of living has gone up 190%, hourly wages of refinery workers have increased 1,000%—yet the selling price of gasoline has risen only 50%.

Another way of describing the change is in looking at how much gasoline a refinery stillman can buy with the wages for one hour of work. This has risen from 2.1 gallons in 1914 to 17.2 gallons in 1959 and can be expected to reach 24 gallons in 1974.

The compact cars have hit the USA market even harder than was anticipated just a few months ago. In November, 1959 (pp. 72-76), the editors of WORLD PETROLEUM indicated that the best estimate at that time for 1959 sales in the USA of compacts would be approximately 1 million, or some 16% of the total sales of all cars. Year-end figures, as reported in *Automotive News* for December 28, 1959, show that the compact sales total will be closer to 1.27 million, or a little over 21% of the total market, which incidentally includes some 600,000 imported cars.

Again, the November prediction indicated that 1960 compact sales would be about 1.5 million, or 23.1% of the market. Current forecasts are that compacts will be 2.5 to 3 million, which could amount to half the overall market.

Upward shifts like these can have significant meaning to U.S. refiners in terms of motor fuel requirements. We'll keep you posted.

What's New in Processing Plants

Shell International Petroleum is investigating the most suitable locations for two new refineries in the Far East—one in Singapore to cost about £4.6 million, and the other in Malaya, estimated to cost £7 million. Both plants have been under discussion with the appropriate governments for some time.

• • •

Phillips Petroleum Co. has started work on a new natural gasoline plant near Artesia, N.M., with an initial capacity of 35 mmcf/d. Slated for completion next fall, the plant's liquid recovery capacity will be about 100,000 gal/day.

• • •

Signal Oil & Gas Co. is considering a "substantial outlay of millions over several years" in an expansion of the 60,000 b/d refinery at Houston of Eastern States Petroleum & Chemical Corp. Signal acquired Eastern States last fall in an $8.5-million stock exchange.

• • •

Condor SpA per l'Industria Petrolifera e Chemica, a subsidiary of Shell Italiana SpA, will expand its 1.7 million ton/year refinery at Rho, near Milan, to 2 million ton/yr during 1960.

• • •

Overall refinery throughput for West Germany in 1960 will rise to an estimated 27.7 to 27.8 million tons (555,000 b/d), an increase of about 6 million tons, or 27%, over 1959, according to a production program laid down by the association of crude oil producers and refiners (AEV).

Two new refineries contributing to the increase will be those of BP at Dinslaken, 992,000 tons (19,800 b/d), and Deutsche Shell at Godorf, 760,000 tons (15,000 b/d). Increases in throughputs planned at other refineries are as follows:

Company & location	Increase 1000 Tons/year
Erdoelraffinerie Emsland, Lingen	1,125
Esso, Cologne	590
Union Rheinische, Wesseling	530
Purfine, Duisburg	500
Gelsenberg Benzin, Gelsenkirchen	400
Scholven-Chemie, Gelsenkirchen-Buer	328
Deutsche Shell, Harburg	220
Deutsche Erdoel, Heide	200
Kleinholz & Co., Essen	200
Deurag-Nerag, Misburg	120
BP, Hamburg-Finkenwerder	98
Ruhrchemie, Oberhausen	90
Ruhrbau, Muelheim (resumes operations)	87

A breakdown of crude oil to be run, by sources, indicates the largest share continues from the Middle East, over 70%, with Saudi Arabia and Iran ranking first among foreign suppliers. German crude will account for about 20%, and the remainder will come from Venezuela, except for 200,000 tons of Russian crude slated to go to Scholven-Chemie at Gelsenkirchen-Buer.

• • •

The Lummus Co. has begun construction of Central America's first refinery, a 3,500 b/d plant at Puerto Barrios, Guatemala, for Matias de Galvez Ltd., newly formed and jointly owned by Shell Oil and Breaux Bridge Refining Co. of Louisiana.

• • •

Construction will start at mid-year on a new $35 million, 32,000 b/d refinery at Korangi, six miles east of Karachi in West Pakistan, increasing substantially the country's refining capacity which for many years has been limited to a small plant at Rawalpindi. Design of the new refinery—scheduled for 1962—provides for possible further expansion to 42,500 b/d. Principal units will include a crude still, hydro-treater and catalytic reformer; and primary products will be motor gasoline, aviation turbo fuel, kerosene, diesel fuel, and industrial fuel oils.

Four companies are joining in the construction, all of them now marketing in Pakistan: Caltex, Stanvac, Shell Petroleum Co. Ltd, and Burmah Oil Co. Ltd. Together they will own 60%, while the other 40% will represent private capital from Pakistani sources.

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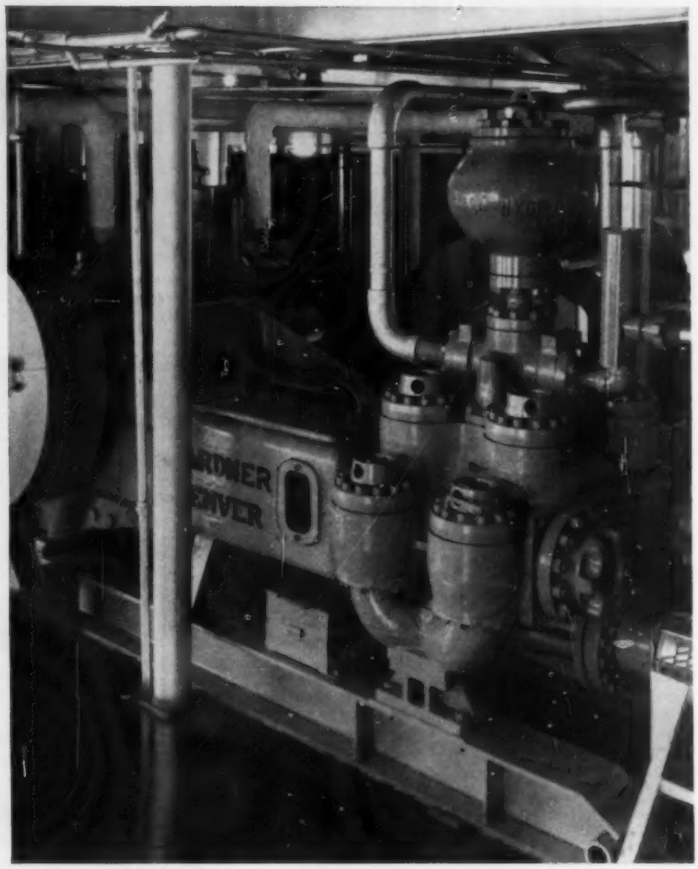

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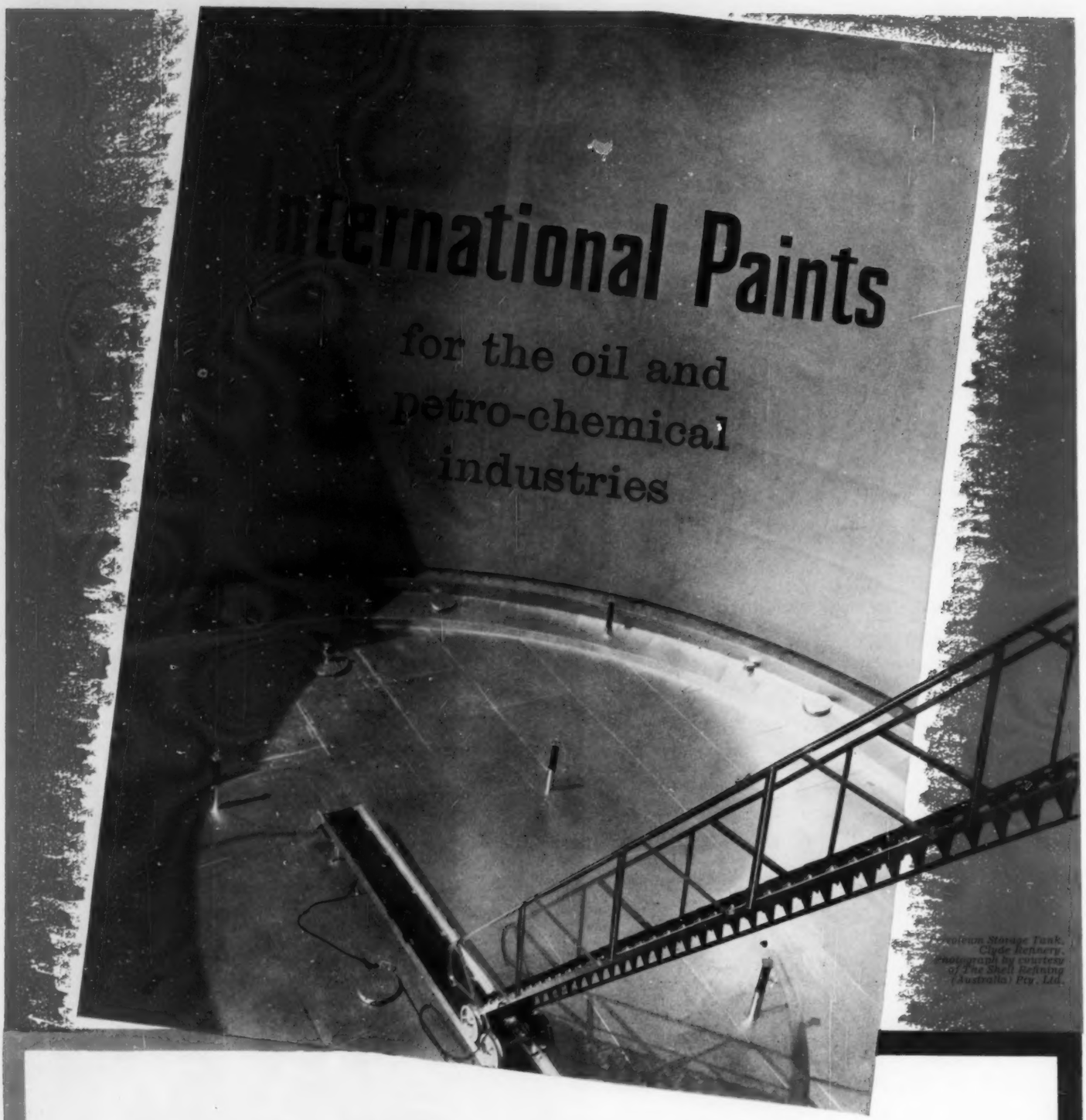

Petroleum Storage Tank, Clyde Refinery. Photograph by courtesy of The Shell Refining (Australia) Pty. Ltd.

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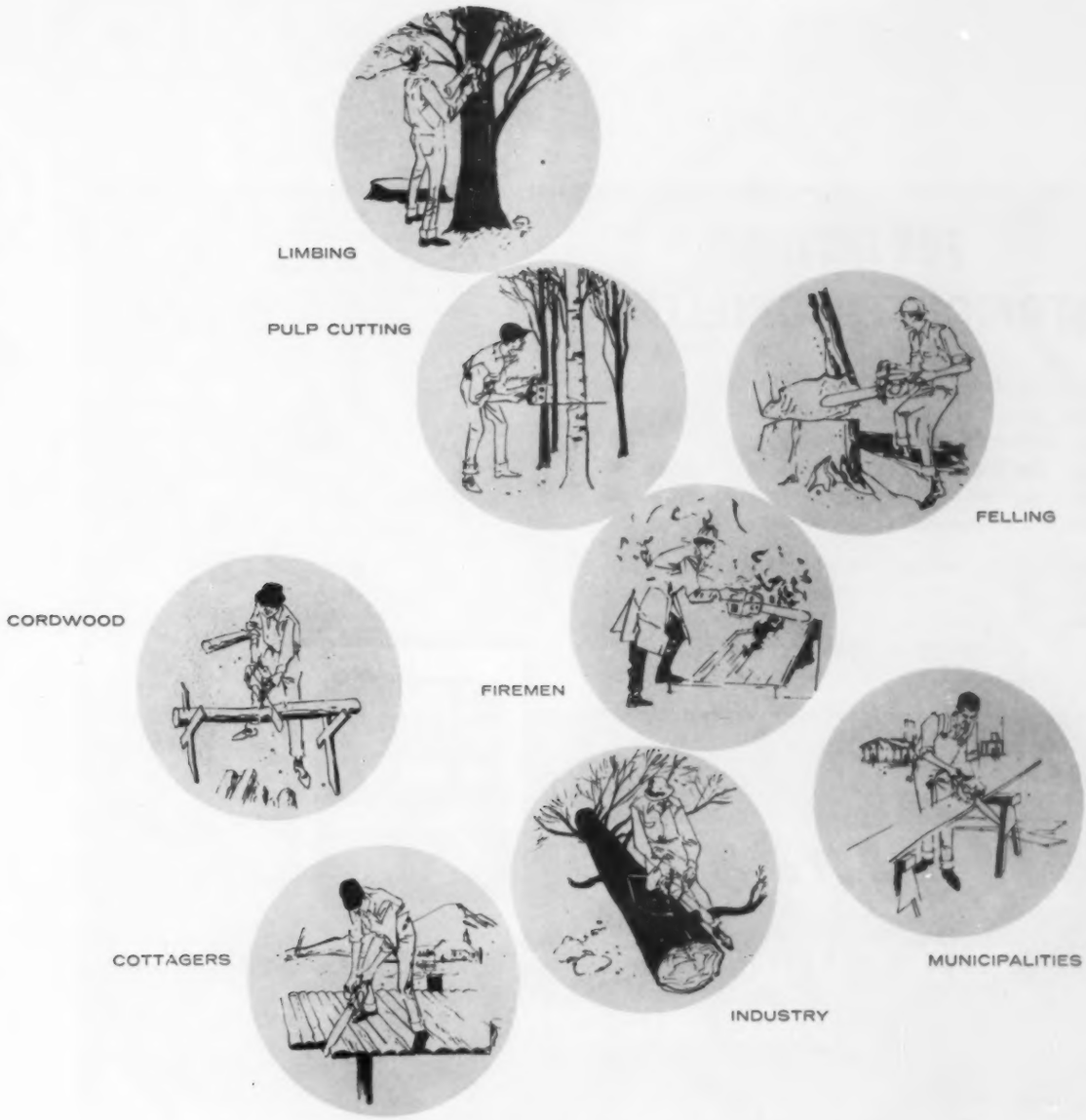

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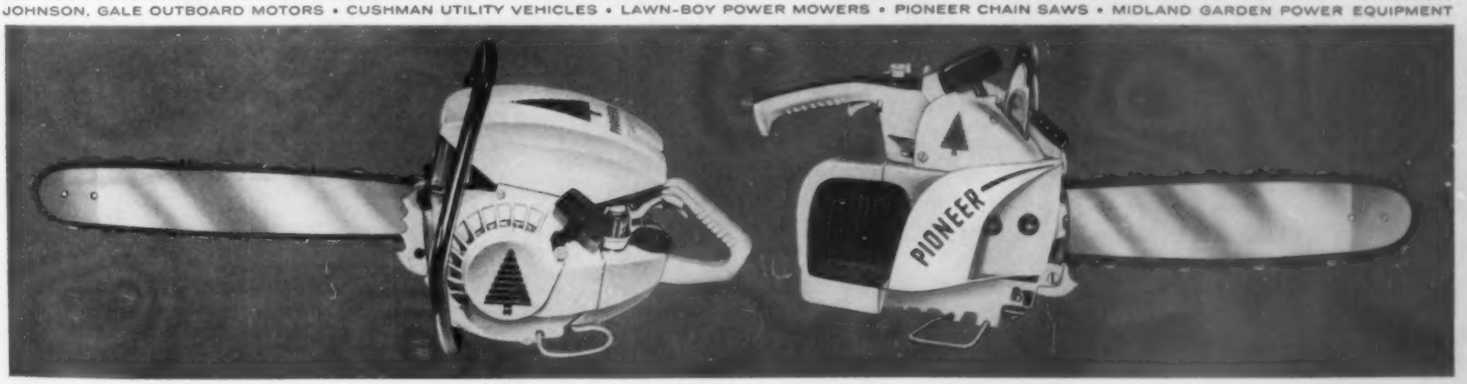

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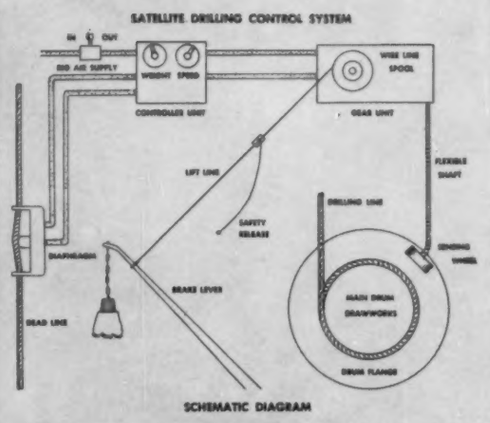

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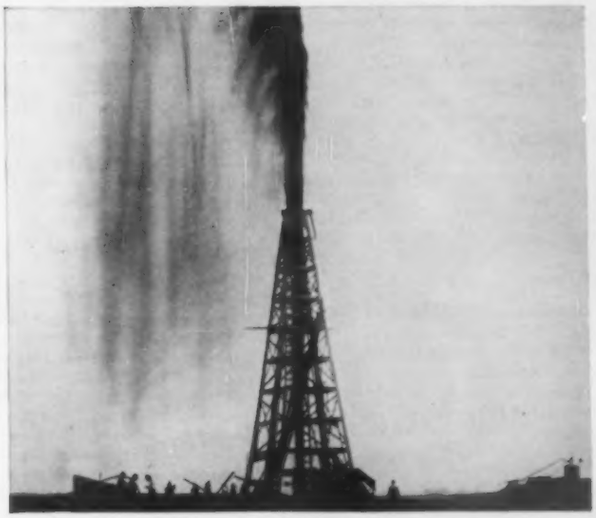
NEWS ON TEXACO PROGRESS

The gusher that brought in 50,000,000 cars



YESTERDAY. When, in 1901, a great gusher blew in at Spindletop — spouting its black geyser against the South Texas sky — the whole world learned for the first time that it could have petroleum in abundance. And it was at the Spindletop field that Texaco came into being — to obtain and market Spindletop oil.

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INTERNATIONAL NEWS AND NOTES

Yemen Concession

American Overseas Investment Corp., has been given exclusive rights to explore for and develop oil and gas in a 10,000 square mile on the northwest coastal plain and offshore coastal waters of Yemen. W. Angie Smith, III, formerly of Oklahoma City, said he signed the concession with the Crown Prince of Yemen, who acted on behalf of the small Arab Kingdom. Mr. Smith is president of the corporation.

The firm is owned chiefly by Texas and Louisiana stockholders. Shelby Owens of Fort Worth is chairman of the board of directors. Mr. Smith is the son of Methodist Bishop W. Angie Smith of Oklahoma City. Mr. Smith, a University of Oklahoma graduate, spent almost six years as a State Department foreign service officer before organizing the firm this year.

U. S. Production Up

U. S. crude oil production in 1959 came to 2,571 million barrels, a gain of 5% over the 1958 level, but still below the 1957 output, the U. S. Bureau of Mines estimated in a year's end statement. Average value of crude oil at the well in 1959 was $2.94 a barrel, a drop of seven cents from the 1958 average. The gain in production is attributed to improved demand and curbs on oil imports.

Natural gas liquids production rose 9% to 13,447 million gallons, the bureau said, due to an increase in output during the summer when demand was unusually high. Average value at producing plants was 5.6 cents a gallon, the same as in 1958.

Marketed production of natural gas climbed 3% to 11,400 billion cubic ft, the bureau estimated. Average value at the wellhead is put at 12.1 cents per thousand cubic ft, up from 11.9 cents in 1958.

Helium production from Bureau of Mines plants rose 40% to 470 million cubic ft. The gain was due chiefly to construction and operation of an additional plant at Keyes, Okla.

Iraq's Oil Profits Rise

The government of Iraq has reported that 1959 income will rise to about 86 million pounds (about $240.8 million) in 1959, an increase of $16.8 million from 1958.

Shell's Good Producer in Libya

Libya Shell's exploration well at Bir Tlacsin Al-Mo, some 125 miles southwest of Tripoli, has flowed under test at the rate of 700 b/d of 44 API gravity oil from 8,882-967 ft and has been completed. This is the closest oil well to Tripoli so far and has cost about £1 million in drilling and testing, largely because of some extremely hard formations encountered which necessitated diamond bit drilling and because the well was taken to 13,187 ft to investigate the deeper formations. A second well is drilling about 3½ miles away to determine the extent of the oil accumulation.

SONJ-Greek Contract

The Greek government and Esso Hellenic Inc., have signed an agreement for exploration and development rights in certain areas of Greece.

Operations will be conducted on approximately 4,000 square kilometers located in the general area of the islands of Paxi and Zakynthos off the southwestern coast of Greece, and in the areas of Killini and Pylos in western Peloponnesia. The corporation will spend a minimum of $6.4 million if operations are continued over the first eight years. If, at the end of eight years no discovery has been made, the entire area will be surrendered. The duration of the development concessions, to be selected by the corporation in case of discovery, will be 30 years with the possibility of a 10-year renewal. This is a 50-50 venture in which the Greek State will receive 50% of the net profits of the corporation, including a royalty of 12½%.

Esso Studies Marine Costs

A full-scale technical attack on marine transportation costs has been undertaken by Esso Research and Engineering Co. and 19 other affiliates of the Standard Oil Co. (New Jersey). Aim of the project is to make substantial economies in the $400-million-dollar bill paid annually by Jersey Standard companies for transporting oil and oil products by water.

Much of the all-out technical attack is being focused on the problem of corrosion. The annual cost of corrosion for the tanker fleet operated by Jersey Standard affiliates totals more than $20 million. New piping and insulation materials and automatic techniques for loading and unloading tankers, including remote control of valves and automatic gauging are to be studied.

French Oil Demand Up

The government has estimated oil demand will increase 54% by 1965, at which time oil will meet 32% of France's climbing energy needs. Coal's share will drop 61% in 1958 to 50% in 1965.

Iranian Wildcat

SIRIP is drilling a wildcat on the top of Mount Sequta in Iran at 8,200 ft elevation. The same company has an exploratory test drilling offshore.

A 140-mile, 10-inch natural gas line from Gach Saran to Shiraz is being laid by the Ministry of Industries and Mines. Deliveries will be about 570,000 cubic meters daily, sufficient for industrial requirements in the area of Shiraz for the next 10 years. The gas will be available to local industries about the first quarter of 1961. Branch lines are being laid from Shiraz to a large fertilizer plant, and a sugar refinery, both at Marvdasht.

Two Refineries for Malaya

A survey team will leave shortly for the Malayan Peninsula—to investigate suitable locations for two oil refineries there—one in the State of Singapore for The Shell Co. of Singapore Ltd. and the other in Malaya for The Shell Co. of the Federation of Malaya.

Ohio Find In Libya

Extending its Dahra field of north central Libya three miles to the southeast, Ohio Oil-Continent-Amerada group's F-2-32 exploratory well flowed at rate 8,000 b/d in December, 1959 through perforations from 3,086 to 3,150 ft and from 3,160 to 3,180 ft. Total depth is 3,765 ft. Oil is 43° API. Oasis Oil Co. of Libya is operator of the group's Libyan acreage. Including this new extension, Oasis has drilled nine wells on Concession 32. Five of these are oil wells, two are gas, while two are dry holes. Oasis is currently drilling three other wells on this concession.

Esso Pipeline In Libya

Esso Libya has contracted with Brown & Root to survey routes for a pipeline to the coast from the Zelten discovery.

World Tanker Fleets

World tanker fleets (100 tons gross and upwards) totalled 37,889,684 tons, according to "Lloyd's Register of Shipping Statistical Tables 1959." Following are the gross tonnages of the leading fleets (and the rises over 1958):

Country	1959 tonnage	Increase over 1958
Liberia	7,077,646	1,458,910
Great Britain and Northern Ireland	6,389,275	460,709
Norway	5,928,706	575,093
U.S.A.	4,339,956	230,525
Panama	2,560,604	236,892
France	1,679,048	103,494
Italy	1,605,894	107,960
Sweden	1,304,573	223,911
Japan	1,302,209	263,336
Netherlands	1,247,655	61,556

The world tanker fleet thus represented 30.3% of the total merchant shipping—124,935,479 tons gross—of which 66,267,154 tons (51.4%) was fitted for burning oil fuel either in reciprocating or turbine engines.

World's Laid-Up Tankers

The Chamber of Shipping of the United Kingdom has started to issue monthly statistics of world shipping laid up for lack of employment. These will be compiled from information recorded at Lloyd's. The first tables give the position at the beginning of November, 1959, reporting the world total of tankers (excluding coastal vessels) laid up at 4,149,383 gross tons, of which British flags represented 595,928 tons and USA 505,449 tons. The only country with a higher figure was Liechtenstein with 1,112,262 tons (17%). Details are given which show that nearly 30% of the world tanker fleet built in 1950 or later is laid up. This information can be condensed as follows:

Year of Build	No.	Gross Tons	%
1934 and earlier	43	334,457	8.0
1935 - 1939	40	351,712	8.5
1940 - 1944	132	1,287,988	31.0
1945 - 1949	100	943,098	22.8
1950 - 1954	60	743,042	17.9
1955 - 1959	25	489,086	11.8
Total	400	4,149,383	100.0

720-Mile Indian Pipeline

Burmah Oil Co. is to start soon laying of a 720-mile crude oil line from the oil fields of Upper Assam to new refineries to be located at Gauhati (Assam) and Barauni (Bihar). Burmah is doing the work for Oil India Private Ltd. First stage will be a 16-inch line from Upper Assam to Noonmati, near Gauhati, site of a proposed oil refinery. This 260-mile stage is to be completed in 1961, when the refinery is to be ready to receive oil.

Second stage will carry the line on another 460 miles of 14-inch to Barauni, where a second refinery will be erected. This job is to be finished in 1962, to coincide with opening of the refinery. Pipe for the second stage is being supplied by Hindusthan Steel Ltd., whose plant at Rourkela is to be operating by September, 1960.

About 750,000 tons of crude oil a year is to be carried to the Noonmati plant and 2,000,000 tons to the Barauni plant. Overall cost is estimated at $111.8 million U. S. The government of India has accepted credits of £23 million, about $64.4 million U. S., from the Burmah Oil Co. and the British Government toward the cost. D. Michael Curran, president of Curran and Co., Great Falls, Mont., and Joe Price of H. C. Price and Co., Bartlesville, Okla., expressed an interest in taking part in the construction last summer. Results of their efforts have not been reported.

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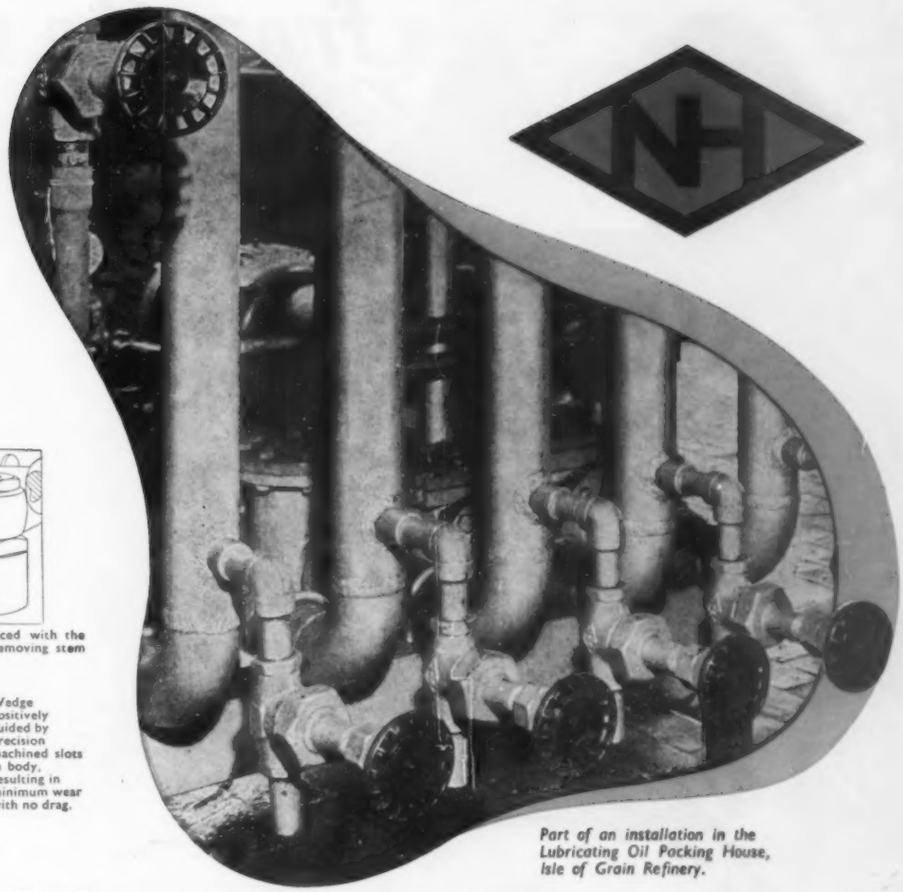
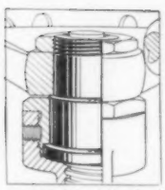
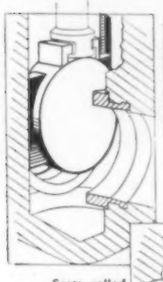


Part of an installation in the Lubricating Oil Packing House, Isle of Grain Refinery.



Yoke sleeve can be replaced with the valve in service without removing stem or bonnet.



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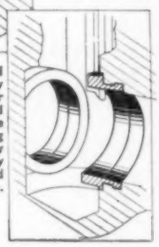

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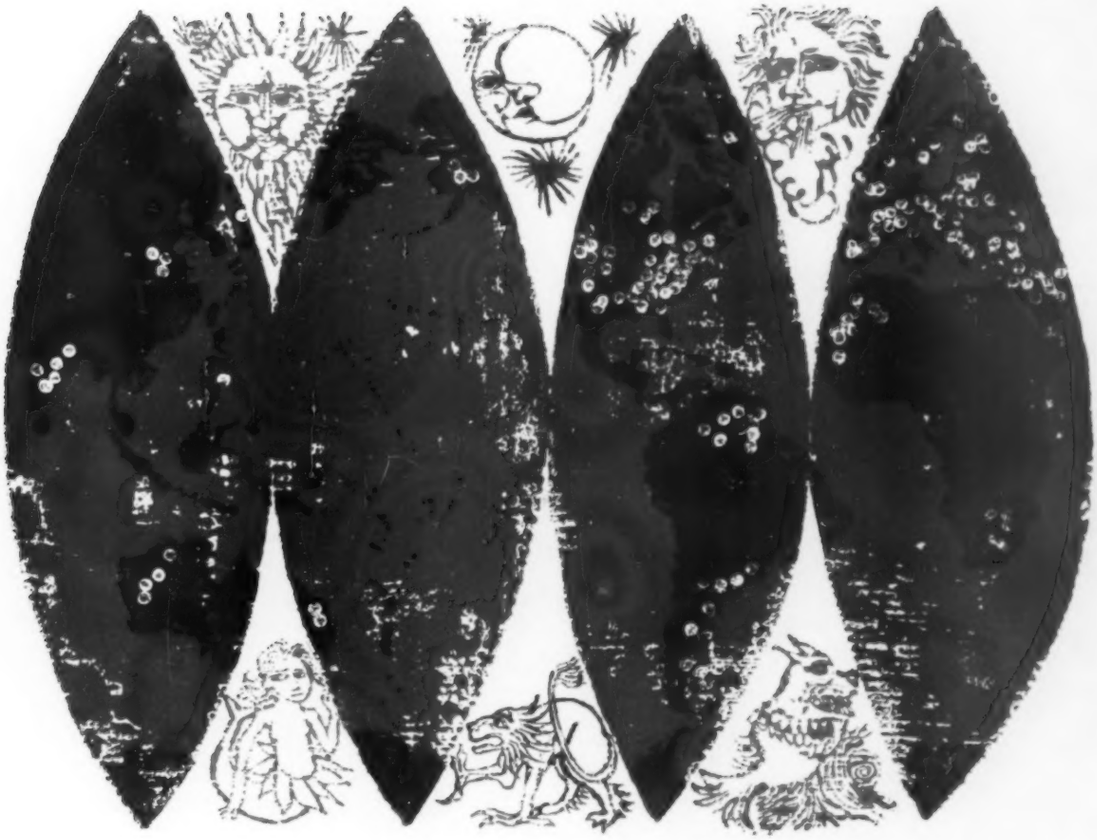

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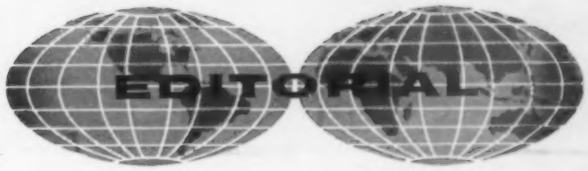


Oil In A Changing World

At the December meeting of the Kuwait branch of the Institute of Petroleum the Hon. William Fraser, managing director of Kuwait Oil Co. quoted two statements dealing with changed conditions in the petroleum industry in the Middle East.

The first quotation was from Dr .Kubba, a minister in the Iraqi Government responsible for negotiating with oil companies in that country, who said that he hoped that the oil companies would realize that the circumstances of 1959 were very different from those prevailing in 1925, 1932, 1937 and 1952, the years in which various agreements were concluded with the companies. He added, that if the oil companies wanted to maintain their cordial relationship with the Iraqi Government it was essential that they should recognize that political and economic conditions, both in the Middle East and in the world as a whole, had undergone a radical change.

The second statement was by M. J. Rathbone, president of Standard Oil Co. (N. J.) who said:

"We in Jersey are thoroughly convinced that the oil world for the next several years will be quite a bit different from the one that existed in the first 10 or 11 post-war years. The change in the supply picture is pronounced. Throughout most of the first 10 post-war years the industry overall seldom had more in the way of a margin of spare capacity than was prudent or necessary for normal operating flexibility, and at times was actually tight. As you well know, this situation has changed markedly. We expect that the industry will have to live with excess capacity pretty much around the world for the next several years. The greatest surplus is in the producing end of the business but a substantial surplus of shipping and refining facilities also exists. Though I believe this extra margin will tend to shrink with the passage of each year, it will certainly last long enough to maintain for some time the unusually intense competition that has been characteristic of world oil markets for the past year or two."

There are thus two changes which have come about, Mr. Fraser pointed out, national changes and company changes. Oil has indeed given tremendous impetus to the Middle East economy since World War II. Few countries have advanced so far and so fast in their standard of living as have Iraq, Kuwait, Saudi Arabia and their neighbors.

The new surplus of oil which has caused company changes stems from a drop in the rate of increase in demand, the opening of new sources for oil and the inroads of other fuels, he said. New oil in North Africa and in Venezuela, expansion in the USSR and increased producibility of USA fields are providing the new competition. In the case of the USA Mr. Fraser suggested that import controls will have shut out enough foreign oil by 1963 to equal the present 1.5 million barrels per day production of Kuwait. In the field of competition it is clear that coal is not yet dead and in Canada and the USA natural gas has become a formidable competitor of liquid fuels.

In the course of his remarks Mr. Fraser had some advice to offer both to governments and to the industry. To the governments he suggested that diversification is most desirable. They should, he said, encourage industries to come into the area which will generate income other than oil. A reduction in the rate of growth for oil markets will not unduly retard development of the Middle East economy if industries are brought in to enjoy low cost fuel and labor.

To the oil companies Mr. Fraser offered the admonition to keep their products competitive with other forms of energy.

On the following pages a study of the past history of Middle East production reveals that output of crude has increased 38% in the past five years. Based on estimates of various economists and the availability competitive position of other producing areas it is suggested that the Middle East may enjoy a further increase of at least 30% in the next five years. The anticipated increase in volume is 1.4 million barrels daily compared with a growth of 1.26 million in the past five years.

Although percentages are growing smaller the world economy still is expanding at a good rate and in the next five years the Middle East should be able to divide up an increase in demand greater than the present combined production of Saudi Arabia, Qatar and Bahrain or nearly as great as the present production of both Iran and Iraq. Competition will be keen but the Middle East has not lost its place in the sun.

MIDDLE EAST —

Production to average 4,900,000 b/d in 1960

Competition of African fields will be severe in the next two years but overshadowed by growth of European and Asian demand during the next five years.

DEMAND FOR MIDDLE EAST crude in 1960 may expand about 360,000 b/d, an increase of 8% over 1959. This is considerably better than the 5% rise attained in 1959 but well below the 11.5% compounded average which Middle East producers have come to expect as normal in the past decade. On the basis of this estimate, Middle East production should average 4,900,000 b/d this year.

Growth of markets for Middle East crude is likely to continue at a good rate through 1961 also, but after that the competition for Western European outlets will become more severe. Libyan oil will not reach Europe until late 1961 or sometime in 1962. When it does become available, the supply will be very large and the economics favorable because of the much shorter haul by pipeline and tanker.

Standard of New Jersey's big discovery in Libya is only 100-odd miles from tidewater and a short sea voyage to market. Jersey's pipeline and terminal system is not expected to be ready for operation until 1962. Until that time the company will center its attention on exploring the possibilities of its find. Oasis Oil Co. will have oil from its Libyan properties ready for market sometime between 1961 and 1963. A precise date is not available at this moment.

In 1959 north and west African production (exclusive of Egypt) averaged only 41,150 b/d. This year it will jump to the vicinity of 135,700 b/d but by 1964 it may reach 605,000 b/d. Gabon is expected to rise from 13,500 b/d in 1959 to 40,000 b/d in 1964. Nigerian production may rise from 8,400 b/d last year to 90,000 b/d. There seems no doubt that the Sahara can satisfy French demand by 1964 and Libya may be sending a substantial amount to European markets in that year as well.

Within the past five years demand for Middle East crude has increased 1,293,000 b/d or 39.8%. This compares with an increase of 1,492,000 b/d or 85% in the 1950-54 period. Increase during the decade has been 2,785,000 b/d or 159.2%.

Limited somewhat by the African developments, total demand for Middle East Oil may rise about 40-50% in the next five years. Based on the large current production this would mean a growth, however, of 1,816,000 to 2,270,000 b/d and bring output from the area to 6,356,000-8,870,000 b/d in 1964.

As suggested above, competition from north and west African crude will not be great enough in 1960 to affect severely the market for Middle East oil. The entire anticipated increase of 94,550 b/d in 1960 will be marketed locally in Africa or will move to Europe. In either case it will be a limiting factor on Middle East oil.

France is eager to make the fullest possible use of Sahara oil and Gabon is a member of the French Commonwealth and hence also will be favored in French markets. It is estimated that pipeline facilities from the Sahara will permit the movement of an average of 80,000 b/d to market this year compared with 16,000 b/d in 1959. An additional 5,000 b/d of Gabon oil is expected. The net increase from the two is thus expected to reach 60,400 b/d.

Political considerations are not a prime factor in the increase of 24,600 b/d in sight from Nigeria. This new oil is from a Shell concession and the company obviously will find it more advantageous to use crude from its own wells than to purchase Kuwait oil from Gulf Oil Corp.

While Africa is increasing its output by 94,550 b/d, it is estimated that domestic demand on the continent will not rise more than about 25,000 b/d.

Asia and Australasia, outside of Communist China, showed only a small increase in crude output during 1959 and the area is not expected to change greatly in 1960. Demand for oil in the far east is expected to rise about 8.8% in 1960 providing an added market for importation of 120,000 b/d from other areas.

Most of the imported oil will come from the Middle East as it has in recent years. Ten years ago the Middle East supplied about 175,000 b/d to Asia and Australasia as compared with an indigenous production of 230,000 b/d. Currently the Middle East ships over 750,000 b/d into the area and domestic production last year averaged only 487,000 b/d. In 1960 the Middle East may well enjoy an increase of very close to 120,000 b/d in demand for crude from Asian and Australasian customers.

The most important customer for Middle East oil has always been Western Europe and the largest increase in demand in 1960 will originate there. Most economists in the petroleum industry now anticipate that Western Europe will require 3,900,000 b/d of oil in 1960, an increase of 300,000 b/d over 1959. Except in Western Germany there is no change in domestic production anticipated in the area. For all practical purposes it may be assumed that local output will be about 246,000 b/d, the same as in 1959. The entire growth in consumption must be imported from other areas.

As previously pointed out, the net exportable surplus of African oil will rise about 69,550 b/d in 1960 and all of this oil will move to European markets.

There has been a small upward trend in

shipments of oil from Soviet bloc nations into Western Europe and it may be supposed that this trend will continue at about its recent pace. On this supposition it may be calculated that 25,000 b/d of additional oil will be imported from Russia and Romania.

Competition of Venezuela crude has been decreasing in European markets for a year. Part of this has been due to the higher cost of doing business in Venezuela resulting from increased taxes. Another factor has been the depressed tanker market. When tanker markets are low as they are today, fields more distant from markets are favored and Venezuela is much closer to Europe than is the Middle East.

Eliminating the bulge caused by the Suez crisis, the Caribbean formerly was able to count on a market of 425,000 to 450,000 b/d in Europe. In recent months shipments to Europe have not greatly exceeded 350,000 b/d.

Venezuela crude is attractive because of its high fuel content which matches consumer demand better than Middle East oil, but the superior quality now seems of less importance than delivered cost. As cargo shipments decline there is a corresponding drop in bunker oil deliveries which tends to enlarge the demand for Middle East oil at the expense of the Caribbean.

It seems logical to assume no new development which will change the attitude of European buyers toward Caribbean oil and it is estimated therefore that imports from this area into Europe will be about 50,000 b/d below the 1959 level.

Except for the Suez crisis period, the USA has shown little change in the level of its oil exports to Europe in the past decade. The volume is only about 50,000 b/d, mostly of specialty products and this may not change greatly.

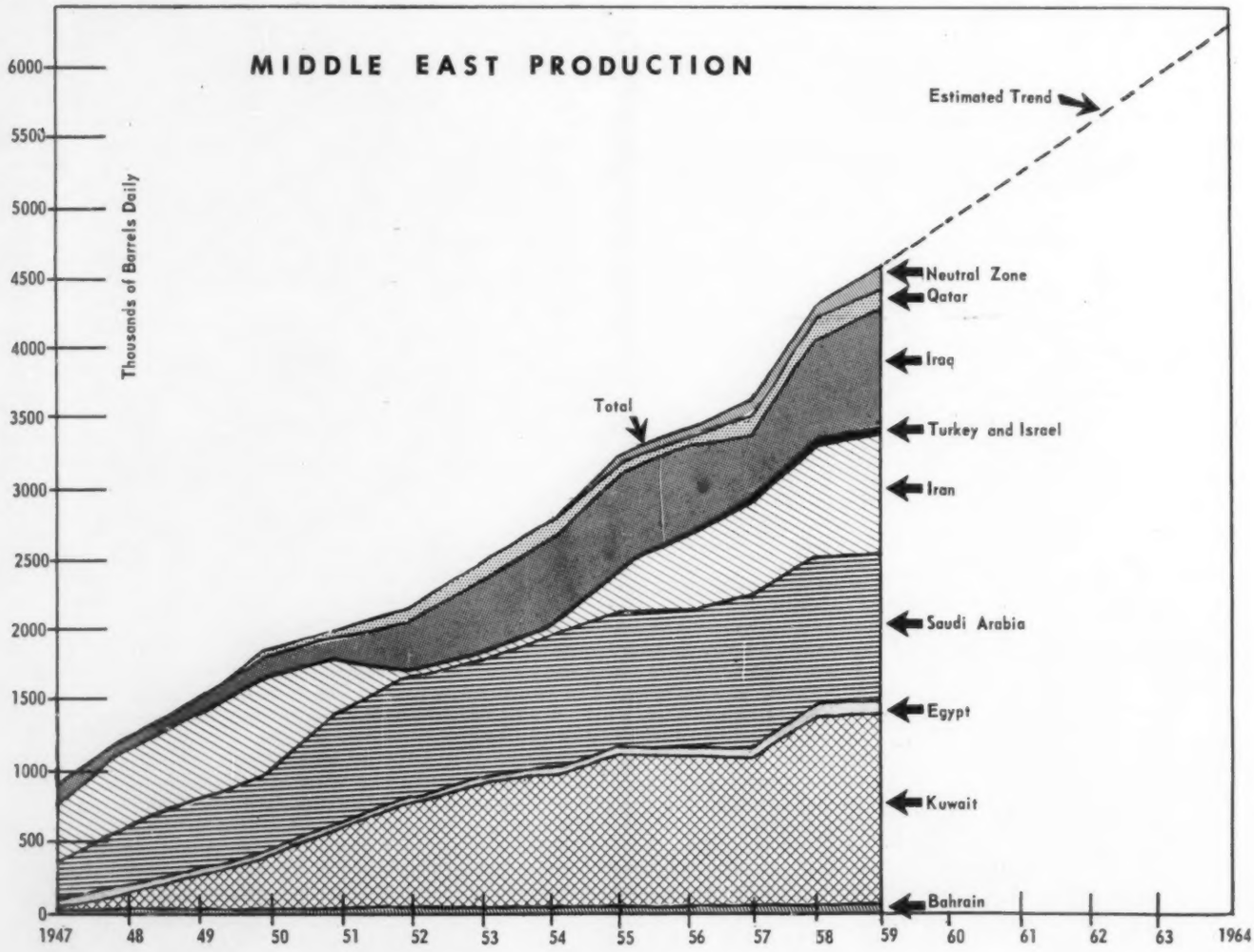
Based on the above, it may be estimated that of the probable increase of 300,000 b/d in Western European oil demand that 69,550 b/d will come from Africa and 25,000 b/d from the Soviet nations while the Caribbean will supply perhaps 50,000 b/d less oil thus permitting the Middle East to enjoy a rise in exports to the area of 255,450 b/d.

Only remaining market for Middle East oil except in local markets lies in the Western Hemisphere and here the picture is not as rosy as elsewhere in the world. Argentina and Brazil, the two prime markets for imported oil in South America are currently expanding their output at a substantial rate, faster than the rise in consumption. No added oil will be required from the Middle East.

USA markets are to be protected against substantial increases in foreign oil again in 1960 and Middle East producers cannot expect a growth in demand. Canadian imports of Middle East oil probably will not increase substantially. As a whole the flow to North America may be more or less the same as in 1959.

In summary the outlook is that shipments from the Middle East will increase by about 120,000 b/d to the Far East and 255,450 b/d to Europe. Local demand will rise about 25,000 b/d while net shipments to the Western Hemisphere may fall as much as 40,000 b/d. On this basis the net anticipated increase in demand for Middle East oil in 1960 will approximate 360,000 b/d.

END.



Arabian American Oil Co.'s board of directors at October 1959 meeting in Dhahran, Saudi Arabia. L. to R.: Paul H. Arnot, Aramco vice president; R. S. Hatch, Aramco vice president; L. M. Snyder, Aramco vice president; Howard W. Page, director, Standard Oil Co. (N. J.); John Noble, president of the Trans-Arabian Pipe Line Co.; Harvey Cash, Texaco vice president; J. H. McDonald, Aramco vice president; Norman Hardy, chairman of Aramco; T. C. Barger, Aramco president; George L. Parkhurst, director and vice president, Standard Oil Co. of Calif.; H. E. Shaikh Hafiz Wahba, Saudi Arabian Ambassador-at-Large; H. E. Abdullah H. Tariki, Director General of Petroleum and Mineral Affairs, Saudi Arabia; R. I. Brougham, Aramco vice president; Robert Siegel, executive vice president (Middle East) of Mobil International Oil, Socony Mobil Oil Co.

Side by side – and beyond

by Harley C. Stevens

Middle East governments have indicated they wish to establish national companies to operate in oil. The result may be beneficial to both the industry and governments if it brings a more realistic appraisal of oil marketing problems.

AMONG THE RESOLUTIONS—perhaps more accurately described as recommendations—adopted by the First Arab Petroleum Congress at its final session in Cairo on April 16 last year, was the so-called "side-by-side" proposal which has become the subject of considerable discussion and speculation in oil circles since then. Specifically, it was proposed that fully integrated independent national petroleum companies should be established by the various participating countries to operate side by side with existing private companies and thus compete with them in all branches of the oil business from exploration and production through refining, transport and sale to the ultimate consumer.

It appears that the delegation from the UAR and the Venezuelan observers present by invitation in Cairo were the most active proponents of this proposal, which is hardly surprising in view of the circumstances. For the Venezuelans had announced such a plan earlier in the year; and the Egyptians already had such a company in operation. In any event, the proposal was a popular one receiving prompt support and unanimous approval. Venezuela in particular promptly has followed its own suggestion by establishing such a national company since the Cairo meeting closed. It is not clear for the moment just how far the Venezuelans intend to go in entering the several branches of oil operations, although from a statement made in Jeddah last October at a meeting of Arab oil experts, it appears that the Venezuelans do not intend to compete with their concessionaires in offshore marketing.

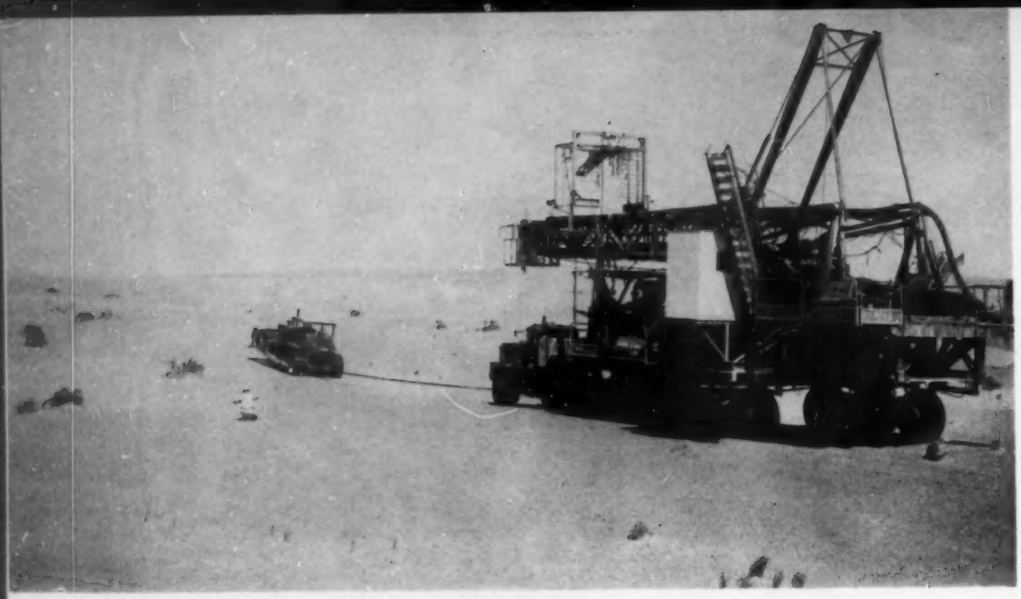
What is probably not fully realized is how far this theory of side-by-side operations has already been adopted in practice in the Middle East. Even less, perhaps, is it realized how far beyond the application of this principle some producing countries in the Middle East have already determined to go. Nor is it fully appreciated the lengths to which Egypt, for example, has already gone in the formulation and application of an over-all pattern of regulation and control of foreign oil companies and their operations within its borders.

It is the purpose of this article first to survey the present situation so as to show not only how far this side-by-side principle has already been adopted and implemented, but also to highlight the steps taken or contemplated by the Middle East producing countries which reach beyond local competition or regulation. Thereafter it is proposed to discuss and assess what further extensions of the side-by-side principle and these other developments may mean in terms of Middle East oil operations in particular and world oil politics in general.

In spite of the fact that both its oil resources and current oil production presently fall far short of those of other major Middle East producing countries—or conceivably

This is the second of a projected series of articles by Harley C. Stevens on relationships of foreign oil companies with Middle East Governments. Unfortunately it must be the last because of the sudden death of the author at his home in San Francisco late in December.

Mr. Stevens was manager of the tax department for Standard Oil Co. of California prior to his service in World War II. After the war he was transferred to Caltex and later to Trans Arabian Pipe Line Co. He served American Independent Oil Co. as special counsel and vice president from 1947 until last June when he resigned to become a consultant in Middle East affairs. He was well known because of his lectures and magazine articles on Middle East politics and economics. He was a director of the Middle East Institute and the Near East Foundation.



The Arabian American Oil Company's new T-32 rig, one of the largest mobile rigs in the world, moves to a new exploratory drilling site in the Rub' al-Khali (the Empty Quarter) in Saudi Arabia.

because of it—we find Egypt appreciably in advance of its neighbors in the operation of a completely integrated national oil company. Because the oil industry has been long established in Egypt, the Egyptians have had the advantage of considerable skilled personnel trained in the past by the foreign companies. But they have also been active in recent years abroad and in their own schools and universities in training young men in the various branches of engineering, in geology, paleontology, and other pertinent scientific fields moreover, of all the Middle East countries, Egypt possesses the largest and best trained nucleus of industrial engineers and managers. Finally, the attack on Suez and the closure of the Suez Canal with the world-wide repercussions which followed including particularly the punitive steps taken by the Western powers and Egypt's subsequent isolation in the two years or more that followed, forced the Egyptians to accelerate the pace of their industrialization and to step up their efforts to find, produce and refine their indigenous oil, as well as distribute the oil products necessary to sustain the resulting expansion of industry.

Thus today we find not only a marked improvement in Egypt's position as an oil producing country—it has been for many years the largest oil consumer in the Middle East—but also a flourishing integrated national oil company run wholly by Egyptians, which not only produces oil, but transports, refines and markets its products. Moreover, this has been accomplished by Egypt's own efforts with substantially all the capital involved being Egyptian, and with a recognition of economic realities not always in evidence in national undertakings of this kind. Although Egypt's entry into oil activities on its own behalf may be a matter of regret to the supporters of private versus state enterprise, nevertheless it is probable that the pattern so set is one that will be followed in principle not only in the Middle East but also farther east in India and Southeast Asia. Indeed, there are comparable counterparts in the West as evidenced by ENI's activities in Italy and elsewhere, while in Russia, oil operations are wholly state owned and managed.

While the subject need not detain us long, it seems desirable to say a word here about the supervision of the oil industry by the Egyptian authorities, for again it is possible that Egypt's example will be followed in other countries. The agency controlling oil affairs is a state organization set up in 1958 known as the General Petroleum Authority, with its head office in Cairo and separate executive departments in Egypt and Syria, each responsible for its operations. Thus the Authority controls all oil activities in both the northern and southern regions (Syria and Egypt) of the UAR. It not only advises the government as to the grant of exploratory licenses and mining leases, supervises all exploration and production activities, regulates the import of crude oil and products as well as allocating the same to refiners and wholesale marketers respectively, but in conjunction with other state agencies, also fixes the local selling prices of petroleum products and determines profit margins the marketing companies may earn!

Finally, it should be noted that the Egyptian government also has a direct share interest in the several "foreign" oil producing and refining companies operating in Egypt. These include the largest and most important company, Anglo-Egyptian Oilfields, (a U.K.—registered company whose shares are held by B. P., Shell, the Egyptian government and individual shareholders in and outside Egypt), and Eastern Petroluem Co., now known as Oriental Petroleum Co. (51% of whose shares is controlled by AGIP, Petrofina and some small American independents, and the balance by the Egyptian Government), the president of which is an Egyptian, in accordance with the provisions of Egyptian law.

All in all, the Egyptian control of oil operations within its borders, its progress in the successful operation of its own integrated national oil company, and the extent of its interests in the foreign oil companies there, are somewhat startling. Obviously, they reflect Colonel Nasser's intention to develop the UAR as, in his words, a "socialist cooperative society" with tight control over the economy and considerable government ownership of, or interest in, industry. It may properly be said that the Egyptian situation is not typical, but at the time it is not wholly atypical either. Thus Iraq, in the past few months, has set up an oil ministry with powers apparently comparable to although not as broad or pervasive as those of the UAR's General Petroleum Authority. Again, the Iranians through NIOC and their representatives on the boards of the operating and refining companies of the Consortium, exercise considerable influence upon Iranian oil operations. It may well be that others will follow.

In the meantime, both Iraq and Iran are well on their way toward their goal of fully independent national oil companies—the Iraqi company already operating side by side with IPC, and NIOC already engaged in producing and marketing activities along side of the Iranian Consortium, at present the only producing and refining group in the country. If and when the Iran-Italian Petroleum Co. (SIRIP), the company formed pursuant to the concession agreement of August 24, 1957, between NIOC and AGIP Mineraria Co., strikes and produces oil in commercial quantities, NIOC by virtue of its 50% share interests in SIRIP, will become a partner in this venture as it will also under similar circumstances in the "joint structure relationship" provided for in the terms of NIOC's concession agreement with Pan American Petroleum Corp. entered into in April 1948, pursuant to which a joint stock company registered in Iran and known as Iran Pan American Oil Co. (IPAC) has been formed. Moreover, under those concessions, they are to share equally in the management of the two companies with half of the board of directors of each being Iranians.

The Iraqis have long had royalty oil to sell, and have, in fact, offered on world markets in past years as well as this year. The difficulty—if it may properly be described as such—from the Iraqi point of view has been that in the past prospective buyers have not unnaturally wanted to pur-

chase this oil at less than the posted price. But it has been neither politically possible nor good business sense to sell below the posted price when IPC was committed—as it has been and is—to buy to posted. There is now,—however, considerable talk of barter deals with China, Japan, North Korea, and other countries and such deals, if made, would offer a way of avoiding the embarrassment that otherwise would surely be present in any outright sale of Iraqi royalty oil for less than IPC would pay for it.

Meanwhile, the Iraqi position with regard to the assertion of some sort of control over oil operations in the country and its progress toward a fully integrated national oil company are worth noting briefly, for again these developments may have a bearing on the future pattern of oil operations in the Middle East. On Sept. 23, 1959, it was announced in Baghdad that it had been decided to set up a General Petroleum Authority in Iraq. Unfortunately nothing definitive was said as to the power and duties of this agency, but it is believed that for the present at least its main concern will be with supervising and directing the operations of the state-owned refineries and the marketing of the petroluem products they produce. These activities are actually carried on by GORA (Government Oil Refineries Administration) which now controls the operation of the Daurah refinery near Baghdad, the al Muftiyah refinery in Basrah and the al Wand refinery near the Naft Khanah field in central Iraq.

The side by side activities of NIOC are at present more circumscribed than those of national oil companies in Egypt and Iraq. They consist mainly of exploration activities near Qum (after their first discovery well caught fire and became unuseable) and in the transportation and distribution within Iraq of oil products refined by the Consortium, as well as certain so-called "non-basic" functions relating to the housing, feeding, transport, medical care, and certain other auxiliary services, required by the operating companies of the Consortium. Like the Iraqis, the Iranians are entitled to considerable royalty oil (as well as to limited quantities of bunker fuel for delivery to certain vessels only) which they are free to dispose of outside the country. The Iranians have also in the past offered their crude for sale in the world market, but have also found that in most instances prospective buyers want a price below posted and have therefore disposed of their crude to the Consortium at the posted prices, except in certain instances where apparently they were able to obtain the posted price.

In passing it may be noted that in Saudi Arabia, Kuwait and Bahrain as well as elsewhere in the Middle East, conditions differ substantially from those in Egypt, Iraq and Iran, so that there has been no occasion to set up side-by-side operations or to create other operating agencies, although Saudi Arabia, of course, has a Petroleum Directorate General. What the future may hold in these countries is impossible to say, but certainly unless and until the pattern of oil activities changes markedly, no material change is to be expected, except possibly in Saudi Arabia where it is known that a stringent petroleum law has been drawn up which, according to reports, would greatly alter the Saudi government's relationship with Aramco. But not enough is known of what the law may provide or when and whether it will be adopted, to base any predictions on what may happen there.

So much for the Middle East scene as it reflects government oil activities both by way of competition with the foreign oil companies, and the regulation of their operations. Of course, more could be said by way of refinement and description, but it is believed the foregoing sufficiently outlines the situation for the purpose of this paper. We turn now to a consideration of what it all may mean, and what the shape of future developments may be.

Here it is perhaps pertinent to observe first that there seems little doubt that in thinking of side-by-side operations by intergrated national oil companies, the producing countries in the Middle East as well as in Venezuela, had in mind domestic oil activities primarly within the particular country concerned such as exist in Egypt and Iraq and to a more limited extent in Iran today. It is probable that the local market will continue to be the major area of activity of the national oil companies in the years immediately ahead. Nevertheless it seems likely this original concept will be modified and enlarged as time goes by, for it would seem inevitable that as production increases and the output of the state-owned refineries rises correspondingly, nearby markets, at least, will be sought for such products. In fact, there is already talk of this; and both the Egyptians and the Iranians are currently delivering bunker fuel to ships plying offshore. And while Iranian and Iraqi attempts to sell their royalty crude abroad have generally so far been abortive, these efforts will doubtless continue. Moreover the possibilities of advantageous barter on a government-to-government basis are being constantly explored.

The same prospect appears in Iraq where the government in the course of its continuing negotiations with IPC aimed at materially amending the existing IPC concessions, announced last May that not only had Iraq's option to take royalty oil been made more flexible by permitting its exercise quarterly (instead of annually as formerly) and at short notice but that, also by mutual consent, the ban on the export of any oil products processed at government owned refineries—long a sore point—had been lifted. Again in the fall of last year the Iraqi Oil Ministry outlined its future plans which contemplate the ultimate operation of the state-owned refineries at full capacity, estimated (by the Ministry) at around 3,000,000 tons annually. This considerably exceeds present Iraqi consumption which is presently about half this amount. The Oil Ministry concluded by saying "plans for exporting the refineries' surplus production were being considered." Admittedly the gap between plans and performance is often great in Iraq as elsewhere; but neverthless the thinking that lies behind these pronouncements is not to be ignored.

In any event, what is significant is that these side-by-side oil activities offer both a training and testing ground for local personnel and so are one of the means by which the producing countries may effectively demonstrate their competence as well as underscore their determination to obtain an increasing share in the operation and management of the vast oil complex created by the foreign companies in area. Meanwhile the more immediate Arab avenue of approach to this problem is insistence on the amendment and revision of existing concessions to increase their share of profits; to provide for a substantial extension of national participation in management and the training of more Arabs in administrative and executive positions as well as skilled jobs; to require the relinquishment of undeveloped areas covered by the existing concessions upon which no rent is paid; and so on. They also seek the formation of all-Arab companies to pre-empt certain operations where possible, such as transport of Arab oil in Arab lines and Arab tankers, and to share in those enterprises in one way or another where this end cannot be realized.

Arab efforts to achieve these aims are being pursued on two fronts, one in the several Arab states themselves and the other in the Arab League. In this matter the league acts through its Economic Council and a subsidiary group, the Arab Oil Experts Committee composed of the leaders in oil matters in all the Arab states. Admittedly the checkered career of the league hardly suggests agreement on policies between the members will come easily, if at all. Yet despite the record, given agreement on essentials between Iraq and Saudi Arabia it is likely that at least some of the dreams of Arab oil experts will be realized before many years have passed.

As outlined at the meeting of the Arab oil experts in Jiddah last October, these include not only the goals just enumerated but also several others which depend on joint rather than several action. Among these are:

1) A standard petroleum law setting forth the basic principles for regulating relations between the governments and concessionaire companies with respect to financial, technical, social and health and labor matters, as well as the terms under which future concessions are to be granted;
2) Unified accounting methods as well as exchange of all useful statistics, data, documents (already practiced to a considerable extent); and
3) The control of Arab oil production (and later world production) in the name of conservation but with the

intent of keeping oil prices up, which includes an effort to require the foreign oil companies "to refrain from altering posted prices without prior approval of the governments concerned."

While the realization of these goals or at least some of them is problematical, nevertheless the aims and intentions of the Arab oil leaders who are pressing forward in each Arab country, as well as in concert through the Arab League, are not to be taken lightly. For in varying degree, they reflect the shape of much that is likely to come. Some will come sooner than others; but the Arab producing countries as well as the Iranians will succeed in enlarging their share in oil profits and in wider participation in the decision making processes as well as in the management functions at all levels of Middle East oil operations, can hardly be doubted.

If it is remembered that in forty years, or slightly more, most of the concessions in the Middle East will revert to the grantors who will then inherit these vast and complex installations, it is not surprising that the producing countries are seeking by every means possible to be ready not only to operate this intricate network, but also to secure a share of the world's oil markets meantime. This is why we hear so much talk of Arab pipelines and tanker companies. This is also the root of the insistence of these countries on training their people by every means possible, on a sharing of responsibility, on a significant voice in management and executive decisions, and so on. It is this, plus their own ambitions and desires to do a creative and constructive job on their own, that also enlists their energies and spurs their efforts to organize and operate side by side with the oil companies of the West, both major and independent.

Who is to say that these hopes and these efforts are not relevant or realistic? It seems quite possible that in these side-by-side activities, in the sale or barter of their royalty oil and products abroad, and in a wider participation in significant activities of the foreign companies, both the Arabs and other producing countries to whom the oil business has seemed so simple because Western operators have made it look easy, may find out the facts of life in the industry. Running their own businesses may have side-by-side educational effects as the Arabs embark on the difficult road that must be travelled in successfully operating the delicate mechanism the international oil companies represent. Perhaps in this way, and only in this way, will some of the myths of the oil business to which these people cling so tenaciously be exploded. Thus they may find, for example, that the buyer of oil and oil products and what he is ready and willing to do or not do, is decisive. For the great oil companies, whatever they may or may not contrive or have contrived, do not and never will control consumption.

The producing countries may come also to see some of the contradictions in their several positions. Thus some talk of the oil companies or their bankers putting up a half a billion dollars to finance an Arab pipeline and commiting millions of barrels of their oil to such a line for a considerable period. In the same breath, they assert the unilateral right to repudiate provisions of concession agreements to which they may be a party, whenever—under conditions they alone may determine—such action is necessary in the best interests of the state. They want production controlled in the name of conservation in order to keep prices high; but they call at the same time for existing concessionaires to relinquish unexploited concession areas for grant to other oil companies which will increase world oil production even more. They want to share in the increments of the value added to the crude oil by others after the oil has left the shores where it was produced, though they have, in fact, added nothing themselves nor even put up any capital to produce such oil. Again in the face of oil developments west of Suez and closer to Europe and the pipelines and other plans for expanding refinery capacity in Europe incidental thereto, and more particularly the insistence of most countries on having their own refineries, the producing countries in the Middle East are also insisting on increasing amounts of oil being refined there without regard to these developments or the economics of the world products market. Yet these markets are already adversely affecting Aramco's Ras Tanura refinery, the Bapco refinery on Bahrain, as well as the great refinery at Abadan. This adverse trend, moreover, may be expected to grow, not to diminish.

Indeed the Arabs seem to look upon their oil as quite other than an ordinary commodity carrying with it some magical and extraordinary properties and attributes not possessed by the oil or the minerals or the like commodities of other countries. Thus they feel at once both cheated and truculent, attributing to the oil companies some sort of demonic purpose that seeks to deny the Arabs their rightful place in the sun.

Beyond all this it would appear the Middle East producing countries not only fail to give sufficient weight to the actual forces of world oil competition, but also to those represented by other oil producing countries themselves. Here the probability that in the next few years the Russians may have a very sizeable crude oil surplus—possibly as much as 500,000 b/d by 1965 according to one expert on the subject, or twice what she is offering on world markets today is seriously to be taken into account. When it is recalled that the Soviet Union, by virtue of its controlled economy, is able to assign export quotas arbitrarily without regard to domestic markets or requirements or the economics of cost, since they need have no concern for profits or dividends, some of the difficulties this threat poses may be appreciated.

We have seen in the case of Iran how difficult it is to restore a producer's position and markets once lost. Moreover, with growing sources of alternate oil supply and the pressure of new producing countries to develop, expand and refine their own oil production, upon which their economic and political fate depend, it is hard to share the view that all these forces can readily be neatly countered and markets obtained and held by fiat, which seems to be so confidently looked to by the Middle East producing countries as the solution to their problems.

These considerations suggest why, in this writer's view, national side-by-side operations supplemented by the initiation of sales of crude and products in the world oil markets are to be encouraged. For only through this experience in the rough and tumble of this competition will these producing countries and their oil experts learn how difficult it is to sell in those markets, and how risky if not reckless it is, to act as if the consuming countries and thus the ultimate consumer were of negligible importance and concern. And while the oil companies, and particularly the great international companies, quite naturally may be less than enthusiastic about even more competition, the truth is that there seems to be no other constructive solution ahead. As the national oil companies develop competent leadership, that leadership must inevitably come to a realization that profitable operations depend on forces which no producer can wholly control. These include both economic and political forces. But the overriding fact above all others at the present writing is that with the great abundance of available oil now entering the world market old fashioned laws of supply and demand are bound to operate. In the process, the present international industry may find that old patterns of operation and control no longer have the same validity or sanctity they once ejoyed. At the same time an equally sobering experience awaits those new national companies which venture into the oil market place, for there is much they have to learn. END

An aerial view of the 'Ain Dar Gas Injection Plant of the Arabian American Oil Co. The $30,000,000 plant, was placed in operation in 1959. High pressure gas from five gas-oil separator plants is compressed in five stages from 125 to 2,100 psi for reinjection through five input wells.

Oil hunt moves offshore

"Adma Enterprise" at the site of Umm Shaif No. 1 well in the Persian Gulf, drilled by Abu Dhabi Marine Areas Ltd., in which The British Petroleum Company has a two-thirds shareholding and Compagnie Francaise des Petroles one-third. British Petroleum Co. Ltd., photograph.

FOUR CRUCIAL WILDCAT WELLS are churning bits on the bottom of the Persian Gulf, three of them owned by so-called "independents." Much of the status of the world's crude surplus depends on the results of these wells; should any of them discover a major field the effect will be to tip the scales even more heavily in the direction of world surplus.

Two important wells are drilling in Iran; one by the IPAC, affiliate of Pan American International, owned by Standard Oil Co. (Indiana), and the other by SIRIP, affiliate of ENI, the Italian government's company.

Pan American is drilling IPAC-A1 from a well-equipped offshore platform wherein a crew of 40 men dwell in air conditioned comfort. At last report, the well was below 8,990 ft and drilling ahead with casing set at 8,500 ft. The well should be below the Asmari limestone now, but no production has been reported. It is probably shooting for the Cretaceous, since the Eocene (Asmai limestone), thins out as it goes toward the Gulf. The Cretaceous is a worthy target, as proved January 1959, when the Consortium's Ahwaz No. 6 flowed 10,000 b/d or more from the Cretaceous at 10,900 ft.

SIRIP is going to extremes, drilling two wildcats simultaneously—one on top of a mountain and the other below the Persian Gulf. Sirip No. 1 offshore well at last report (early January) was down to 6,373 ft and casing set at 6,363 ft. Drilling is going ahead with no shows reported. The other wildcat on top of Mount Sequta was heldup by a heavy snowfall and has not progressed far as yet.

Shell Co. of Qatar Ltd. is making its second attempt to find oil offshore since its first drilling platform was destroyed by a storm in December 1956. The platform had drilled two wells, both dry. Shell built another platform in Germany and towed it out during 1959. It arrived on December 5th and is drilling another exploratory well at present.

Abu Dhabi Marines Areas Ltd., owned two-thirds by British Petroleum Co. Ltd. and one-third by Cie. Francaise des Petroles, is drilling up its discovery offshore made in 1958 at No. 1 Adma, now No. 1 Umm Shaif. The company had drilled three wells, the first was located at 25° 12′3″ north, 53° 13′10″ east and found about 2,400 b/d of 40° API oil. A second well No. 2 Umm Shaif, was drilled two miles west and found oil. It went to about 7,724 ft. A third was a producer at 7,908 ft. The discovery excited much interest originally but is proving less valuable as drilling progresses. Umm Shaif No. 3, which went eventually to 10,100 ft, has been less encouraging than the first wells.

Arabian Oil Co., owned by Japanese interests, obtained similar concessions from Kuwait and Saudi Arabia to drill offshore from the Neutral Zone and is currently drilling ahead on its first wildcat. A fire destroyed equipment during 1959 but the platform was intact and International Drilling Co., the contractor, is again drilling. The fire was caused by a gas blowout at shallow depth; it excited the Japanese interests who feel sure they have a potential producer in the well. This well has good prospects. It lies near Safaniyah, the largest offshore field in the world, which is currently producing for Aramco.

Another drilling rig is being brought in by the Japanese now, and they confidently expect to have established production of about 200,000 b/d within a few years.

The UK petroleum industry – 1959

Highlights of the annual review:

- Percentage of petroleum in fuel use rises from 15.1 to 19.2
- Motor fuel consumption rises 8% ; fuel oil up 33% over last year.
- Refinery capacity reaches 44.8 million tons annually.

by Cecil W. Wood
European Editor

THERE IS EVERY REASON to be satisfied with the results of continued efforts to improve the United Kingdom economy in 1959. A few recent pointers will suffice.

The Treasury's "White Paper on the Balance of Payments" estimated provisionally that Britain earned a surplus of £142 million on trading overseas in the first half of 1959, compared with the revised figure of £112 million for July-December 1958. An interesting point about the former figure is that for the first time Britain sold more to North America than she imported.

Capital Investment and Equipment Orders: It is greatly to be regretted that the "Ministry of Power Statistical Digest 1958" gives no details of oil industry capital investment for that year, but merely repeats the figures given in the preceding volume. Thus the last figure available remains at £107.9 million for 1957, comparing with £58.1 million in 1956.

A development of great importance in the equipment sphere is the formation by the Council of British Manufacturers of Petroleum Equipment of a subsidiary—British Oil Equipment Credits Ltd.—to promote schemes for the sale abroad on deferred terms of British-made petroleum equipment. This was formed to give effect to a £3½ million agreement with Pemex for a Platformer at Minatitlan. CBMPE chairman has said this agreement may be raised to £7 million, that BOEC may be able to assist in another large project in Latin America, and that it has other projects under consideration. It can largely be credited as due to the formation of BOEC that membership of the CBMPE has risen sharply—to around 515 from 453 on March 31.

Many examples could be quoted of new types of heavy equipment made in 1959, but three will suffice to illustrate the advance: The first offshore drilling platform, the "Orient Explorer," made by John Howard & Co. and the DeLong Corp. for use by Shell in the South China Sea; the floating terminals for the Fao-Amaya loading jetty of Basrah Petroleum made by Swan, Hunter & Wigham Richardson at Wallsend-on-Tyne and the fabrication by Armstrong Whitworth (Metal Industries) and Wright Anderson Ltd. of the first complete Oil Well Supply Co. rigs fitted with the new 128-ft "Lever-Lift" mast, part of an order of 16 for YPF Argentina, all of which were despatched by the end of 1959. Another interesting development is the merger of facilities of Woodfield Rochester Ltd. and the Lithgow group of shipbuilding and engineering concerns to supply offshore drilling equipment in "package" form. Frequent references in the London Letter of this journal have borne witness to the growth of inter-relationship in the oil equipment field between American and British firms.

The value of orders for material and equipment placed in the UK by oil companies for domestic use and export was £122.1 million in 1958 against £134.1 million in 1957, according to statistics collected by the Oil Companies Materials Association. Orders have been well maintained, and the total for the first nine months of 1959 was £83.2 million against £89.5 million in the 1958 period.

Imports, Exports and Prices: Comparison of imports is once again free of the bedevilling complications that ensued as a result of the Suez Canal closure. Total imports in the first 10 months of 1959 were 18.2% higher than in the same months of 1958, and crude oil alone was 19.3% up. Home-produced exports, however, were slightly below the 1958 level. See Table 1.

During these 10-month periods, unit cif values of crude oil fell by 0.67 d/gal (8.3%) to 7.44d, and refined oil by 0.19d/gal (1.8%) to 10.71d. The decline for motor spirit was 0.39d/gal. 2.9%) to 12.91d, and that of fuel oil—the largest drop of any—was 0.75d/gal (9.6%) to 7.09d.

Both wholesale and retail prices were unusually stable. Motor spirit was unchanged throughout the year to mid-November, while gas/diesel and fuel oil were raised a halfpenny a gallon and diesel engine road fuel one penny.

Role of Oil: The latest Ministry of Power data shows that in 1958 (in coal equivalent) oil was approaching the 20% mark, the details being shown in Table 2.

Consumption and Fuel Policy: Petroleum Industry Advisory Committee statistics show total deliveries (excluding bunkers for foreign-going ships) into consumption for the first nine months of 1959 at 26.4 million long tons (including 2.3 million tons refinery consumption) a rise of 3.9 million (17.4%) over the total of 22.5 million tons (including 1.8 million refinery consumption) for the same period of 1958. The total 1958 figure was 3.1 million tons, of which 2.5 million was refinery consumption, and all signs point to a 1959 total of 35-36 million tons. The relative trends in the leading products are illustrated in Table 3.

A minor factor, but deserving of mention in the consumption picture, is the drive by major distributors to popularize the domestic use of oil by credit schemes to ease the cost of plant installation and the use of portable space heaters by improved kerosine distribution services. It has recently been stated by a Shell-Mex and B.P. official that the UK overall consumption is probably something under 1½ million tons a year, representing on a thermal basis a little less than 5% of all fuel used for this purpose.

Noting that sales of premier grade paraffin had passed the million-ton mark for the first time in 1958 and the enormous growth in the use of portable heaters, he expected these to rise from 8 million heaters in 1958 to 12 million in 1960.

To return to the heavily accentuated trend to a heavily oil economy, especially in the face of even more excessive coal stocks and the closing of uneconomic pits, it is not surprising that agitation by mining and labor interests has strengthened for a change in the government policy of "free fuel choice for all consumers" and, in particular, a re-examination of power station fuel policy.

That the oil industry understands these problems is shown by its voluntary modification of oil contracts with the Central Electricity Generating Board. The government, for its part, is aiding the situation and has decided on changes in power station plans that will bring a big measure of aid to the coal industry over the next few years. Two big stations designed to burn oil will now use coal; one conversion from coal to oil will not take place; and two other conversions are being postponed. To this extent the oil consumption picture may be changed, but it is recognized by the oil industry as being in the national interest.

Aid to Town Gas: Although strictly outside the orbit of this oil industry review, the growing inter-relation with the town gas industry must find brief mention, especially as the year includes a landmark of great potentiality. This is the joint venture of the Gas Council and Constock International Methane, culminating in the delivery in the "Methane Pioneer" between February and October to Canvey Island (Essex) of five of the seven 2,000-ton cargoes of liquid methane planned from the USA. Though admittedly uneconomic on this scale, the experiment is declared technically successful and the council is shortly putting plans before the government for building a 20,000-ton methane carrier or, more probably, two 10,000-tonners. Meanwhile, the "Methane Pioneer" is regarded as being on a normal regular schedule.

Some figures from the last Gas Council report illustrate the growing use of oil in several forms in aid of town gas supply. See Table 4.

Pipelines: A number of important pipeline projects are in hand, and in November came a report of the most ambitious scheme to date under normal conditions.

Work started in April on the construction of six 23-mile underground pipelines from the Shell refinery at Stanlow. Two of these, a 6-in. for light products and an 8-in. for heavy oils, will go to the new Shell-Mex and BP installation at Partington, and the other four will be used for transferring feed-stock, chemical intermediates and finished products between Stanlow and Shell Chemical Co.'s Carrington petroleum-chemical works. This latter £1 million project is nearing completion.

Partington, where construction is well advanced, will be Shell-Mex and BP's first distributing center to be supplied entirely by pipeline and is regarded as an important link in its reorganized UK distribution system. Work is proceeding at both ends of the supply lines and in November about 50% of construction was complete. The project involves many difficult river, canal and rail crossings.

The construction of a 24-in. welded and buried pipeline approximately six miles long from Shell's Tranmere installation to the existing Shell Eastham installation to connect Stanlow refinery with the new Mersey docks and harbor board jetty at Tranmere on the River Mersey is at present in progress for overall completion in May 1960. A section of this line, approximately a mile long, is being laid on the River Mersey foreshore under tidal conditions. The land section of the line incorporates a 240-ft long tunnel 12-ft diameter currently being excavated at a depth of 80 ft under the Bromborough dock lock.

Parliament has sanctioned the laying by Shell-Mex and BP of an 8-mile, 6-in. line to supply its new depots in or near London Airport from its Walton-on-Thames storage so as to meet future increased jet fuel demand without raising the already heavy traffic density around the airport. The laying of this line is now under way.

British Petroleum's 60-mile, 18-in. line from the new Angle Point (Milford Haven) tanker terminal to its Llandarcy refinery is also making good progress. By the year-end, about 15 months from starting work, all pipe was expected to be welded together, laid underground, and ready for hydrostatic testing. With completion of the terminal in July, the line will have a capacity of 5,000,000 tons a year.

As this review is completed, a report appears that Esso Petroleum is considering laying a pipeline from Fawley to supply the west London area and London Airport with refined oils. This would be the longest private oil pipeline in the country and a major project considering the many obstacles involved.

TABLE 1—UK OIL IMPORT-EXPORT TRADE

(Million Imp. gal and million £ ster)

	1959 (Jan.–Oct.)	1958 (Jan.–Oct.)	1958 (Jan.–Dec.)
Imports:			
Crude oil	8,517	7,139	8,487
Refined oils	2,705	2,355	2,885
Total	11,223	9,494	11,672
Value	384.6	348.2	462.2
Exports:			
Quantity	1,614	1,664	2,059
Value	72.1	75.8	92.3

TABLE 2—UK TOTAL PRIMARY FUEL CONSUMPTION

	1958 Tons	1958 %	1957 Tons	1957 %
Coal*	198.9	80.2	207.7	84.2
Petroleum:				
Black oils	23.1	9.3	15.7	6.4
Other oils	24.5	9.9	21.5	8.7
Total petroleum	47.6	19.2	37.2	15.1
Nuclear and hydroelectricity	1.6	0.6	1.7	0.7
Total inland consumption	248.1	100.0	246.6	100.0

*Gross inland coal consumption adjusted for exports and stock changes of coke, coke breeze and manufactured fuel.

Refining: For the first time, in "Ministry of Power Statistical Digest 1958," official figures of UK refining capacity by individual plants are available. These go back to 1953 and the totals are as follows:

UK REFINING CAPACITY

(1,000 Long Tons per Annum)

1958	38,229	1955	30,855
1957	34,359	1954	29,264
1956	31,158	1953	28,707

A rise of just over 33% in crude processing capacity in five years is seen from these figures. Unlike the generally accepted lists, this official one excludes Shell's Ardrossan refinery (160,000 tons/year at end-1958).

Two important crude distillation units were brought on stream early in 1959 and for this reason, capacity had increased appreciably by end-1959. Figures supplied to WORLD PETROLEUM are given in Table 5.

The latest guide to refinery activity is that total throughput in the first eight months of 1959 was 25.8 million tons, a rise of 4.6 million tons (21.7%) over the 1958 period. For the entire year of 1959 there is certain to be an appreciable increase —probably to a total of 38 to 39 million tons.

To consider individual refinery projects, Shell Refining Co. brought on stream early in 1959 a second crude distillation unit at Shell Haven, with a capacity of 80,000 b/d of Middle East crude. This approximately doubled refining potential to 8 million tons a year and, with the addition of Stanlow, Heysham and Ardhossan, brought Shell's total UK capacity to 15 million tons.

Construction of a patented Shell "trickle" phase 2,400-ton/day hydrodesulfurizer

TABLE 3—DELIVERIES INTO UK CONSUMPTION

(Million tons, January to September)

	1959	1958	Percent Rise
Motor spirit	5.4	5.0	8.0
Kerosine	1.1	1.1	—
Gas/diesel oil:			
Diesel engine road fuel	1.7	1.5	13.3
Other	2.2	2.2	—
Fuel oil*	9.7	7.3	32.9

*Excluding refinery consumption: 1959–2.3; 1958–1.8.

TABLE 4—UK OIL IN TOWN GAS MANUFACTURE

(Year Ended March 31)

	1959	1958
Refinery gas bought and reformed, million therms	64.7	20.2
Refinery gas as proportion of town gas supply, percent	2.2	0.7
Oil purchased for gas making and associated purposes, long tons	707,000	600,000
Oil gasification plant capacity, million cu ft	128.5	57.0
Oil used in gasification plant, long tons	144,800	65,700
Yield from gasification plants, million therms	41.6	16.2

TABLE 5—UK REFINING CAPACITY

(Mid-1959, in Tons/Year)

Berry Wiggins & Co., Ltd.	
Kingsnorth	160,000
Weaste	110,000
British Petroleum Co. Ltd.	
Isle of Grain	9,000,000
Grangemouth	3,400,000
Llandarcy	3,100,000
Briggs, Wm., & Co. Ltd.	
Dundee	41,000
Esso Petroleum Co. Ltd.	
Fawley	11,405,000
Lobitos Oilfields Ltd.	
Ellesmere Port	185,000
Manchester Oil Refinery Ltd.	
Trafford Park	175,000
Mobil Oil Co. Ltd.	
Coryton	1,890,000
Scottish Oils Ltd.	
Pumpherston	175,000
Shell Refining Co. Ltd.	
Shell Haven*	8,000,000
Stanlow*	5,250,000
Heysham	1,800,000
Starhaven Refineries Ltd.	
Ardrossan	160,000
UK TOTAL	44,851,000

*Partly owned by Starhaven Refineries Ltd.

costing about £2 million was completed during the year. This is the first such unit at Shell Haven; the previous one being at Stanlow. A 20 ton/day pure liquid sulfur recovery plant has also been built.

At Stanlow a gas-treating plant is being built to meet the 10-year agreement with the North Western Gas Board, starting mid-1960, for the supply of 12 to 24 million therms a year.

The second crude distillation unit brought in early in 1959 was by British Petroleum Co. at Grangemouth, marking the end of the first stage of a £6 million program to raise refining capacity from 2.2 to 3.2 million tons a year. Other units commissioned later in 1959 included a de-ethanizer for improving propane gas quality, a copper chloride gasoline sweetening unit, and treaters for kerosine and gas oil. At BP's Llandarcy refinery a new laboratory was opened in August.

The only news of 1959 developments at Esso Petroleum Co.'s Fawley refinery is that a Powerformer, costing about £4 million and operating at 19,000 b/cd, was brought into use in the first half of the year. This is equipped with facilities for onstream catalyst regeneration and is integrated with a Hydrofiner to provide desulfurized feed; and a new naphtha stabilizer was added.

Mobil Oil Co. commissioned a new LPG plant at Coryton in January, providing high-purity propane and also light off-gas for delivery under the supply contract with North Thames Gas Board. The second stage of this project, the production of butane, was completed towards the end of the year.

The silver jubilee of Lobitos Oilfields' Ellesmere Port refinery—one of the earliest companies in the UK to enter this field of activity, and at a time when the wisdom of such a step was widely debated—was fittingly celebrated by the opening of a new laboratory.

Caltex group's long-mooted plan to build a large refinery on Southampton Water has finally been abandoned in the face of very widespread opposition by local interests on the grounds of loss of public amenities.

The only new UK refinery building is Esso Petroleum's £18 million, 4½ million ton/year plant at Milford Haven (Pembrokeshire). This went into the winter with construction up to schedule, with processing due to start next September and regular product delivery by end-1960. The 11.4 million ton/year Fawley refinery, though still capable of considerable expansion, is now regarded as having reached the maximum economic size Esso feels it ought to have in one location. Milford Haven will be the first British refinery to be air-cooled throughout.

The Italian AGIP group has been making a UK market survey and exploring the financial procurement aspect with a possibility in mind of building a refinery and establishing a number of motor fuel retail outlets.

Petrochemicals: Over the first nine months of 1959, feedstock delivered inland for petroleum-chemical plants rose by 96,700 tons (14.8%) over the 1958 period—to 749,300 tons from 652,600 tons. Further, in the third quarter, deliveries were at a new high level, averaging 92,500 tons a month.

A landmark for Shell Chemical Co. was the mid-year inauguration at Shell Haven of a 75,000 ton/year ammonia plant built at a cost of £6½ million. Part of this ammonia is converted to nitric acid and a substantial proposition of both products is sold to Fisons Ltd.; the balance is used by Shell to make "Nitra-Shell," a solid fertilizer based on chalk and ammonium nitrate.

Fisons' Stanford-le-Hope plant adjoining the refinery was also opened in the summer with 400 ton/day (140,000 ton/year) capacity of ammonium nitrate for use in the company's granular fertilizers. An interesting point is that liquid ammonia is stored at 55 psig and 5C in an insulated 2,000-ton sphere—the largest of its kind in Britain.

Another Shell Chemical Co. development was the announcement in February that large-scale facilities were being built at its Carrington works for the production of polyolefins. The first stage of this project embraces an output of 30,000 tons a year of polyethylenes and polypropylenes, including high-density polyethylenes made under Ziegler license.

At Grangemouth, British Hydrocarbon Chemicals is constructing its third cracker, with completion set for mid-1960. This will have an ethylene production capacity of 70,000 tons a year and will more than double the potential for olefin production, the largest unit of its kind outside the US and considerably bigger than any other built in Europe.

Other BHC news in regard to Grangemouth is that a polyethylene plant for making the new high-density plastic sold as "Rigidex" has been commissioned, and that plants to make phenol and acetone were due to come into operation late in 1959.

The year 1959—tenth anniversary of the opening of Imperial Chemical Industries' great petrochemical complex at Wilton and Billingham—saw the bringing in at Wilton of its third olefin plant, based like the others on a Kellogg steam cracker. ICI developments are reviewed in considerable detail in a separate article in the January, 1960, issue of WORLD PETROLEUM, pp. 44-47.

Monsanto Chemical Co.'s new polyethylene plant at Fawley, which only came into production early in 1959 at an initial rate of 10,000 tons a year, is already being expanded but no details are available.

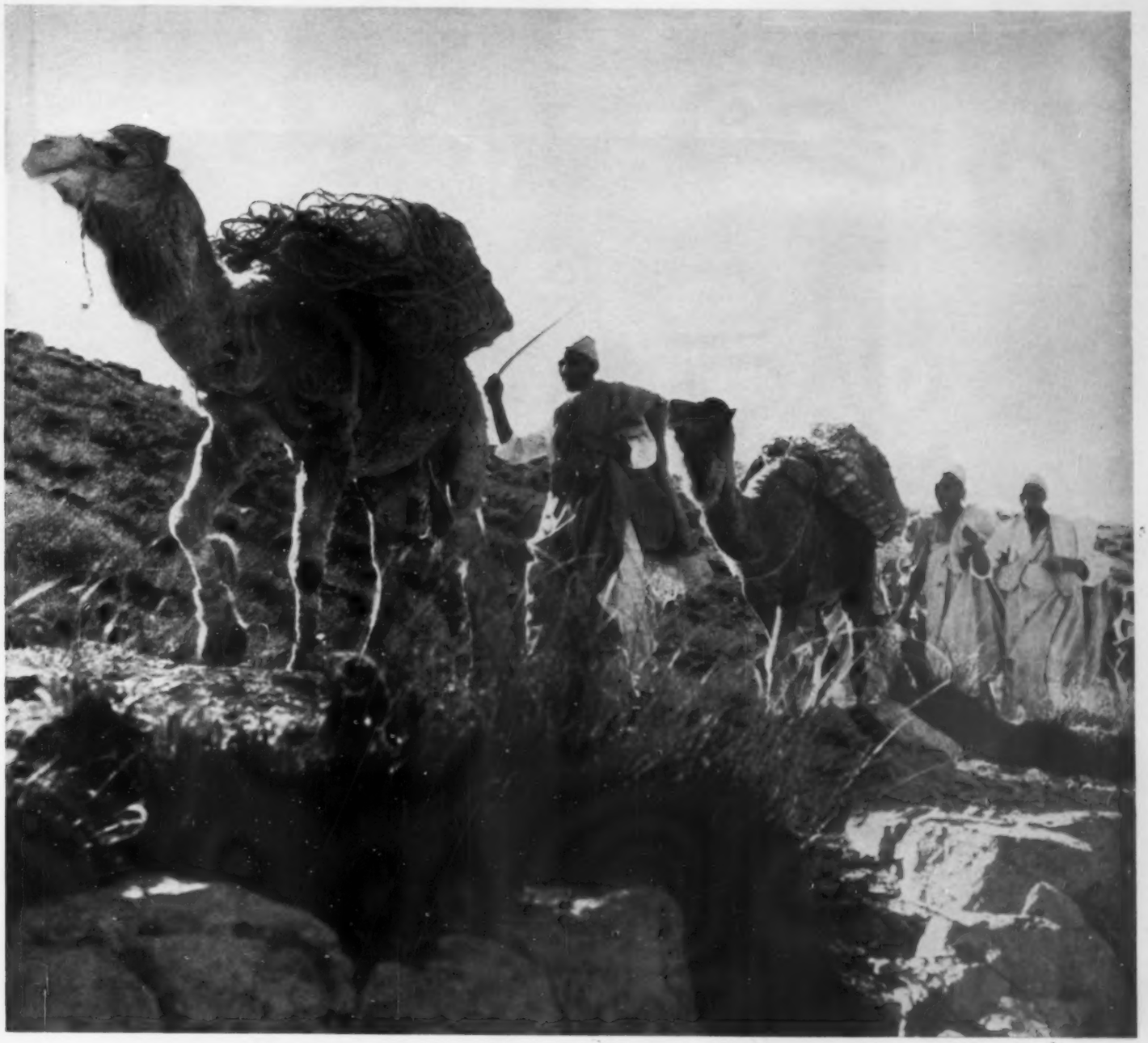
Union Carbide is augmenting its £3 million polyethylene production facilities at Grangemouth and is building a £1¾ million, 30 million lb/year unit scheduled to be operating late 1960. This will double its existing capacity of this petrochemical.

At its Hythe (Southampton) works, Union Carbide's 45 million lb/year ethylene oxide and derivatives plant—was reported at mid-November to be on schedule and was fully expected to be operating by the end of 1959.

Two items of news are available in the synthetic rubber field. In the year to September from the opening of International Synthetic Rubber Co.'s £6 million plant at Hythe, the range of "Intol: styrene-butadiene rubbers had been increased from three to six types and work has commenced on a new plant to produce 2½ million gallons a year of synthetic latex. A steady market awaits these in several fields. The Hythe plant is understood to be operating around its capacity figure of 70,000 tons a year and there are reports of it being expanded to 90,000 tons. Rubber Study Group figures put the UK rise in synthetic rubber consumption in the first eight months of 1959 at 18% over 1958, to a total of 48,300 tons.

It can now be stated that the neoprene synthetic rubber plant of Du Pont Co. (United Kingdom) Ltd. building on a 380-acre site near Londonderry (Northern Ireland) is due for completion May-June. The company is still, however, not ready to reveal its production capacity. This is the Du Pont group's first such plant outside the U.S.

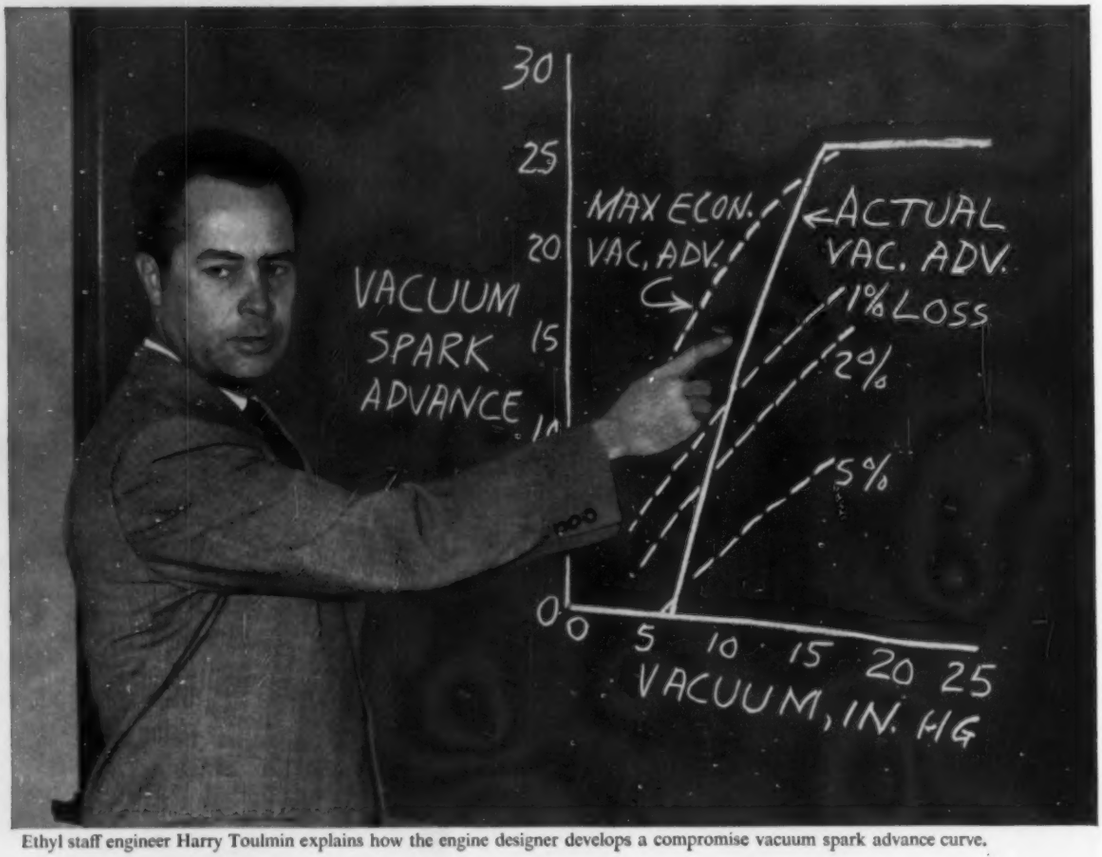
To conclude this review, it can be asserted that 1959 activity makes a picture not only impressive but perhaps surprising to many. It provides clear evidence that the industry is keenly alive to its responsibilities of being ready to meet the increased UK supply demands that must be made on it, and with the maximum of economy. END.



LIBYA

Dynamite for shot-firing being carried across country by camel train. BP Exploration Company (Libya) Limited is now searching for oil over six concession areas in Tripolitania, Cyrenaica and the Fezzan.

BP



Ethyl staff engineer Harry Toulmin explains how the engine designer develops a compromise vacuum spark advance curve.

Ethyl Research Studies Part-Throttle Knock

What causes it. How to control it.

DURING the past several years, knocking complaints have been recorded for certain premium-fuel-requirement passenger cars at part-throttle as well as full-throttle conditions.

Part-throttle knocking generally occurs at a point between full-throttle and road load, usually at low engine speed and from 8 to 14 inches manifold vacuum. Studies have shown that these conditions are frequently duplicated by the average motorist when operating his car in city traffic at low engine speeds.

Fuel Quality can control Part-Throttle Knock

When the problem of part-throttle knock becomes apparent in a particular car series through customer complaint, the difficulty can be relieved by increasing the Motor octane of the fuel or by adjusting the basic spark advance of the vehicle. A change in fuel quality would be more desirable since this retains top engine performance and maximum fuel economy.

What causes Part-Throttle Knock?

When the engine designer develops a new passenger car engine, a number of compromises are made to obtain optimum performance and durability for a given cost, weight and fuel requirement. One compromise is in the ignition advance curve. The full-throttle advance curve is usually retarded from maximum power by 1 or 2 percent in the mid-speed range.

This yields optimum engine power for a given octane requirement. By taking this small initial power loss, the octane requirement is reduced sharply—2.5 to 4 octane numbers. This establishes a full-throttle requirement for the engine.

To improve fuel economy at road load and between road load and full throttle, a vacuum advance unit is usually added to the distributor. This provides additional spark advance which adds to centrifugal advance at light engine loads. The spark advance curve cannot be set for optimum economy across the entire part-throttle

range without increasing requirement excessively. So a compromise curve is used which gives the best economy without part-throttle knocking problems on typical motor fuels. If not enough compromise is made, the vehicle will be part-throttle knock limited.

Octane number requirement for such a vehicle is shown in the figure to the right. With sensitive reference fuel, octane requirement peaks at manifold vacuum of about 12″—and is a number higher than at full throttle. This is due to severe depreciation of sensitive fuels (those having large differences between Research and Motor octane) at light loads. Under these conditions, carburetor mixtures are leaner, mixture temperatures higher and exhaust gas dilution is greater—all of which contribute to the depreciation of the sensitive fuel.

Motor Octane is the Key

Since low sensitivity fuels are depreciated less than high sensitivity fuels, the part-throttle knocking problem is relieved by increasing the Motor octane number. This was substantiated recently in the Ethyl 1959 Premium Gasoline Antiknock Behavior study.

Road antiknock performance data were obtained on 30 premium fuels in five 1959 passenger cars. In addition, data were obtained in seven cars on two special sets of fuels, one with constant Research octane number and one with constant Motor octane number.

Both of these studies indicated that the most important fuel factor in controlling part-throttle knock is Motor octane number. In the low-speed range where most part-throttle knock occurs, Motor octane number has effectiveness of approximately unity, but Research octane has little or no effect on road octane number.

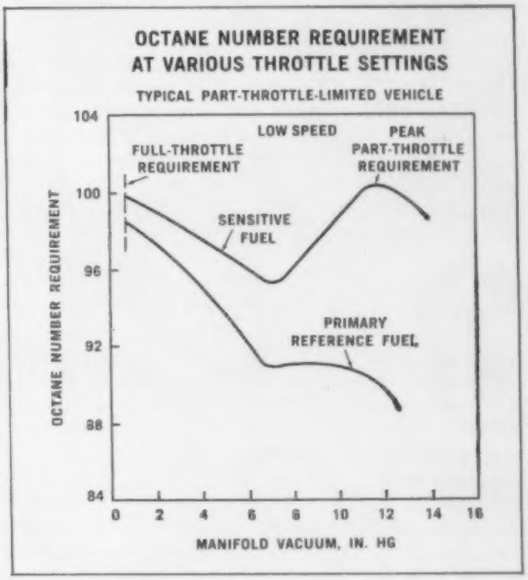
Fuel hydrocarbon composition has very little effect on road performance at low speed. In the high speed range (3000 rpm) an increase in Motor octane number of one unit will increase the road rating by two units, while an increase in Research octane number will actually decrease the road rating. At 3000 rpm an increase in aromatic content and a decrease in olefin content will increase the part-throttle road rating of a fuel.

Control by Engine Adjustment— A loss in economy

An obvious way to correct part-throttle knock is to reduce the spark advance at part throttle. This defeats the original purpose of the manufacturer since it reduces operating economy in this driving range.

A recent study showed that approximately 40 percent of the tank fuel is consumed in the 5″ to 15″ manifold vacuum range under some commuter driving conditions.

Further, a reduction of part-throttle spark advance can change the part-throttle response (acceleration) of a car, causing flat spots. This, in turn, can be corrected by enriching the mixture—a further loss of economy.



How Ethyl Research can help you

For a detailed discussion of part-throttle knock, ask your Ethyl Representative for copies of the Ethyl research paper, "Part-Throttle Knock," presented at the SAE National Fuels and Lubricants Meeting in Chicago, October 28-30, 1959.

Additional information on the subject of part-throttle knock can also be found in the Ethyl report entitled, "1959 Premium Gasoline Antiknock Behavior." Your Ethyl Representative will be glad to supply you with copies, or arrange for a presentation of this major project by an Ethyl Refinery Technologist.

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The new tide in France

by Jean-Jacques Berreby

MARKETING SAHARAN OIL, which will be in ample supply after 1963, has been the headache of a number of French officials in recent months. It has been a headache because they wanted neither the Compagnie Francaise des Pétroles, nor the foreign major companies to incorporate "national" oil into the existing international system of compensation. Instead, a number of young technocrats were struggling and pleading for the creation of a new marketing organization to compete with established companies, both with French C.F.P., British B.P. and Shell, and American Esso, Mobil Oil and Caltex. And they were ready to compete not only on national soil but also abroad and first of all in the European Common Market. From these endeavors, stemmed the so-called Jeanneney plan.

As a first step, a new marketing company has been formed in France. It is made of entirely state-owned oil-producing companies and the B.R.P. It has been emphasized that the B.R.P.—as its name implies—was created solely to further the search for oil and gas in French territories after the war. But now that it has more or less succeeded in this task, some quarters suggested that it could if not disappear, at least be reduced considerably. Instead, it is looking for a new job for itself.

The new company is called Société Industrielle des Pétroles. The participation in it will be B.R.P. 1/3, Régie Autonome des Pétroles 1/3, the last third being shared by S. N. REPAL, S.N.P.A., S.P.A.E.F. and some financing organizations. S. N. REPAL, as a big producer in Hassi-Messaoud, will receive 20%. R.A.P. is the main shareholder of CREPS, with Edjelé and Zarzaïtine fields. S.N.P.A. produces some oil from the Lacq gas field and has already been successful in El Gassi in the Sahara. S.P.A.E.F. exploits the Gabon oilfield.

The new organization has conducted successful negotiations with the Caltex group French affiliate, Caltex S.A.F. which is selling its tankers, refinery and marketing system to the newly formed state company and will keep a minority interest, believed to be 40%.

It is the second time that the Caltex group has sought association with a French marketing group. The first time was in 1953, when Caltex S.A.F. was about to merge with Omnium Francais des Pétrole, (OZO), or rather with the metropolitan France affiliates of the company. The new company was to be called OZO-CALTEX, the American company keeping a 45% working interest. On Dec. 3, 1953, a first Assembly examined the assets of each of the five companies (four affiliates of Omnium and Caltex) and agreed on a distribution of shares. The merger was decided in principle and a new meeting was scheduled. It never took place. The meeting was called off and so was the merger. One of the versions of the reasons for failure was that Compagnie Francaise de Raffinage, an affiliate of C.F.P., had refused at the last minute to cancel the contract by which it was providing products to Omnium Francaise des Pétroles. The contract was good for another six years and OZO had to live up to it.

Partly because of his opposition to the formation of the proposed new national oil marketing company Finance Minister Antoine Pinay has resigned. It is assumed that this change in the de Gaulle government may remove uncertainty which has surrounded the project.

Today the situation is quite different. The French government had been trying to prevent C.F.R. from buying the OZO marketing system during 1959, while S. N. REPAL was struggling to create its own marketing organization. At the same time Caltex despaired of really developing a big marketing organization in France, corresponding to its production and investment potential. This explains why the company's chief representative in France went to see the French authorities in August 1959 to offer a new combination: An association of OZO and Caltex with the French producing companies of the Sahara. As one of the main company's spokesmen in Paris said to me: "Our refinery is marginal and our distribution is under-developed. It will not be profitable if the government obliges us to take 60 or 80% of Saharan oil."

I asked him whether it was true that his company was glad to get rid of a non-profitable business. "As you remember," he answered, "our refinery, Raffineries de Pétrole de la Gironde, was entirely destroyed during the war. We rebuilt our plant in the Bordeaux region but we were refused permission to build it to a big capacity. Under the law, we cannot even import all of the crude for our refinery and are obliged to refine for other companies. In general, an oil producer invests large sums of money in a refinery to process his own oil and not other producers' oil. If tomorrow we have to refine more and more Saharan crude, we do not see any profit in it."

From this reasoning, the idea took shape to sell Caltex S.A.F. assets to the French government, keeping only a minority interest. But the Jeanneney Plan goes farther. The young technocrats which he supports dream of no less than unifying all the numerous small French distributors.

According to the latest "Authorizations of importation," (Dec. 5, 1958), the French gasoline market is shared by 70 companies. But most of the small companies are affiliated to a big one, with a trademark, so that there are only eleven trademarks.

At the beginning of 1959, the French gasoline market represented 4,899,484 tons of which only 196,211 were not affiliated to a trademark of a big company. The trademarks are:

	Tons/Yr.	*Number of Affiliates*
SHELL ICA	816,047	1
ESSO	689,920	1
AZUR	509,000	1
TOTAL	538,437	24
ANTAR	484,587	1
B.P.	439,414	2
MOBIL OIL	277,611	1
OZO	268,426	6
AVIA	256,300	15
CALTEX	238,187	1
PURFINA	185,344	1
Miscellaneous	196,211	16

Most of the independents, including the bigger ones like AZUR and ANTAR, rely on Compagnie Francaise des Pétroles for their supplies since they have no production. The government project plans to include as many as possible of the "independents" into the new marketing organization, built up by S.I.P. and Caltex. It will begin with OZO, and is putting pressure on AZUR and ANTAR as well. And it is confident that it will absorb most of the smaller fish, including those customers of C.F.P./C.F.R.

It is suggested that those companies who resist absorption by the government marketing agency should be forced by law to buy at least half of their licensed capacity in Saharan oil.

The policy of absorption infuriates the Compagnie Francaise des Pétroles, which was considered until not very long ago as France's main instrument for an oil policy. Since the war, C.F.P. has made considerable efforts to develop its marketing system both at home and abroad. In the past few years, it has been engaged rather successfully in building new markets in numerous countries abroad, in Europe, Asia, and Africa. Ever since the first discoveries in the

(*Continued on page* 63)

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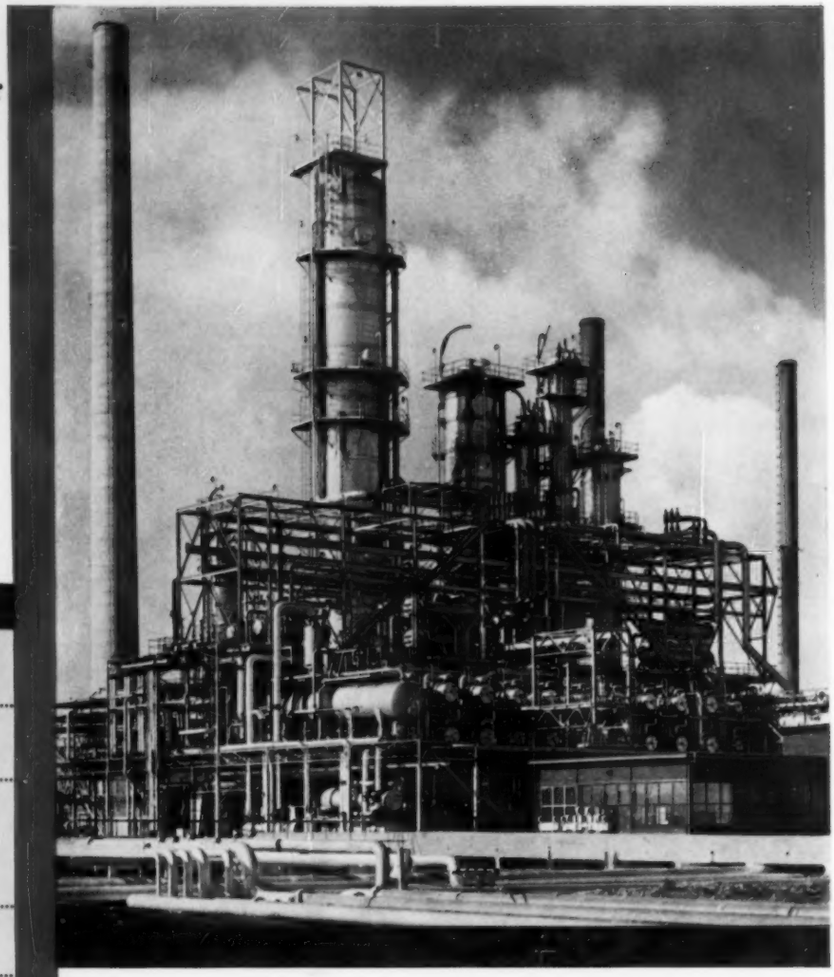

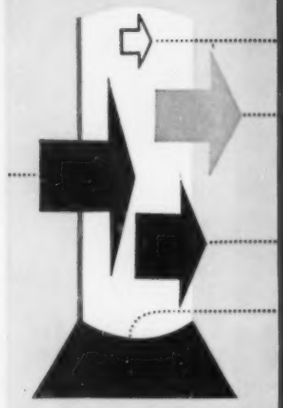

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Illustrated are examples of medium and heavy duty trucks operating in The Persian Gulf Area and the Argentine.

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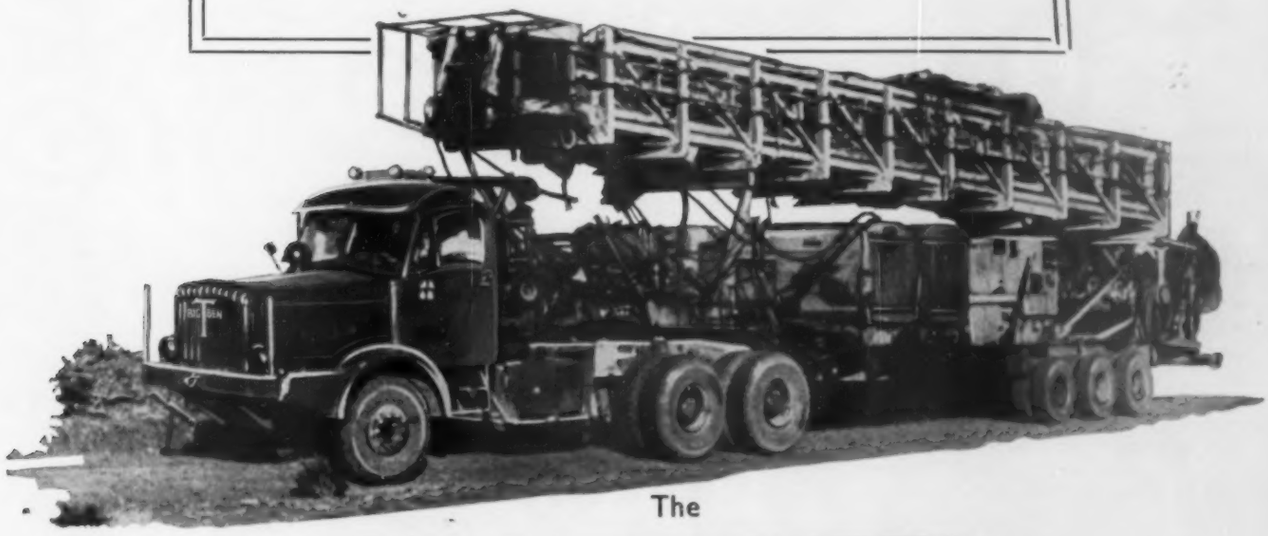

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BRANCHES AND AGENTS THROUGHOUT THE WORLD

Lubricating grease in Europe and South America

by D. C. Sandy*

TABLE I—EUROPEAN GREASE INDUSTRY TODAY

Country	Thousands of lbs Production	Imports	Exports	Plants Complete	Limited
France	66,900	9,800	2,000	4	8
Germany	88,700	20,500	12,400	40	13
Italy	30,000	—	500	30	—
Netherlands	53,300	1,800	48,900	3	—
United Kingdom	89,600	5,100	44,800	5	8
Belgium	11,600	4,600	1,800	9	10
Denmark	6,000	1,000	3,000	1	3
Finland	2,500	1,100	—	1	—
Norway	800	3,600	—	—	1
Sweden	3,300	8,800	200	3	—
Switzerland	6,600	1,700	100	4	3
Europe total	359,300	58,000	113,700	100	46
Exports outside Europe			46,800		
Exports to European countries			66,900		

TABLE 2—SOUTH AMERICAN GREASE INDUSTRY TODAY

Country	Thousand lbs Production	Imports	Plants Complete	Limited
Brazil	23,300	300	3	5
Argentina	27,800	—	—	4
Uruguay	1,400	—	—	2
Chile	4,900	2,900	—	4
Colombia	6,700	—	—	1
Peru	3,500	—	1	—
Cuba	1,700	1,900	—	1
Total	69,300	5,100	4	17

CONTRARY TO A CURRENT impression that the USA export market for lubricating grease is diminishing, the larger countries in both Europe and Latin America already are supplying most of their requirements of lubricating grease.

At the end of World War II, many of Europe's pre-war plants had been destroyed. Others had been damaged and subsequently repaired so they could operate on a make-shift basis. Even though most of the countries were short foreign exchange, particularly dollars, it was necessary to turn to the United States for the lubricants needed to help rebuild European industry. Between 1945 and today, most governments have exerted pressure on the lubricating grease industry, as well as other industries, to expand local production to meet local demands. The results are shown in Table 1, which tabulates by country the local production and imports and exports.

Countries whose imports are small compared with their exports or which have significant exports are in the upper group in Table 1. French imports, it will be noted, are quite small; its exports largely are to French overseas territories. Germany both imports and exports but is a small net importer. Italy appears to be self-contained. The Netherlands and the United Kingdom are small importers but large exporters. Each of these countries ships about half of its exports outside the European area.

Among the other European countries, Norway and Sweden import much more than they produce and have insignificant exports. Belgium has relatively substantial imports but does some exporting. Denmark exports more than it imports but these shipments are believed to go mainly to the other Scandinavian countries. Finland seems to import about one-third her requirements. Switzerland, while a substantial producer, still has significant imports relative to its total demand.

In summary, Europe's exports are about twice imports, but when the disappearance of half the Netherlands and United Kingdom exports outside the European area is taken into account, Europe as a whole appears to produce about the amount of lubricating grease it consumes.

With respect to number of plants, it will be noted that Italy and Germany have 30 and 53 respectively. All of those in Italy are believed capable of producing a complete line of greases while 40 of the German plants are similarly equipped. France and the United Kingdom have a smaller number, 12 and 13 respectively. Four of the French and five of the United Kingdom plants produce a complete line of products. In the Netherlands, there are only three plants, all of which are understood to manufacture a full line. At least one plant in France, one in Germany, two in the Netherlands and two in the UK are modern plants, built since World War II.

Among the countries with a smaller volume of grease production: Belgium has 19 plants, nine of which produce a full line of products. Denmark has four but only one of these is capable of making modern quality. Very little is known about the facilities in Finland. The one plant in Norway can make only the simplest type of conventional greases. All three of Sweden's plants have modern equipment. Four of the seven in Switzerland are reported to produce the full range of modern greases.

In total there are 146 lubricating grease manufacturing plants in Europe, 100 of which can make a complete line of products and at least some of which are of recent construction. So far as is known, no plans have been announced of new grease plants in Europe.

Turning now to South America, the same type of information as presented for Europe is given in Table 2. Here, again, the more industrialized countries such as Brazil and Argentina produce large quantities of lubricating greases and apparently are substantially self-sufficient since they import negligible quantities. Production in Uruguay, Colombia and Peru, while comparatively small, appears substantially to satisfy the requirements of these markets. Chile and Peru do have some manufacturing facilities; however, the output of these plants must be supplemented by imports in order to meet local requirements. The lack of foreign exchange has been more critical in South America than it has in Europe. Therefore, it has been more necessary than was the case in Europe to use products which could be made in existing local facilities even at some sacrifice in the qualities. It will be noted that 21 plants are known to exist in South America. Of these, however, only the three new plants in Brazil and one in Peru can produce a complete line.

A new grease plant is reportedly under construction in Venezuela and its output probably will be large enough to supply the demands of that market.

In summary, both Europe and Latin America appear to have sufficient productive capacity to supply local requirements. Facilities available in Europe can produce modern quality products over the complete line of solid greases. Although no new construction has been announced for Europe, there seems no reason to believe that these countries will not continue to be self-sufficient.

In South America, local production is largely meeting local requirements. However, there would seem to be room for the installation of more modern equipment if local suppliers are to meet the demands for modern-day, higher-quality products. END

*Mr. Sandy is with Standard Oil Co. (New Jersey). This article is based substantially on a paper he presented at the recent annual meeting of the National Lubricating Grease Institute in New Orleans, La.

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Mercedes-Benz builds 24 different diesels with powers ranging from 17 to 3,000 h.p. This comprehensive program means that the right engine can be selected for every drilling assignment whether to power the rig or the pump or to raise the drill pipe. Every engine is precisely equipped for the job it has to do and conforms to international safety regulations. And don't forget: in buying a Mercedes-Benz product, you're getting top quality.

Types and Performance Data

Type	No. of cylinders Arrangement	Output P S (DIN)	Speedrange R P M	Cyl. Bore ins	Stroke ins	Piston displacement cu. ins	Weight approx lbs
M 202 B	2 / S	35— 55	750—1200	5 1/2	8 1/2	394.8	1665
M 203 B	3 / S	54— 96	750—1200	5 1/2	8 1/4	591.9	2150
M 204 B	4 / S	72— 126	750—1200	5 1/2	8 1/4	789.0	2715
OM 636	4 / S	17— 35	1500—3000	2 15/16	3 15/16	107.8	495
OM 312	6 / S	47— 77	1500—2400	3 9/16	4 3/8	279.5	990
OM 321	6 / S	55— 94	1500—2600	3 3/8	4 3/4	311.2	1025
OM 315	6 / S	80— 124	1200—1800	4 7/16	5 1/2	505.0	1875
OM 326	6 / S	97— 155	1200—1800	5 3/64	5 1/2	660.0	1720
MB 846 A	6 / S	114— 250	750—1500	5 7/16	7 1/2	1230.2	3860
MB 846 B	6 / L	114— 250	750—1500	5 7/16	7 1/2	1230.2	3970
MB 846 Ab[1]	6 / S	148— 320	750—1500	5 7/16	7 1/2	1230.2	4080
MB 846 Bb[1]	6 / L	148— 320	750—1500	5 7/16	7 1/2	1230.2	4200
MB 846 Ad[2]	6 / S	148— 320	750—1500	5 7/16	7 1/2	1230.2	4200
MB 836 B	6 / S	230— 350	1000—1500	6 7/16	8 1/16	1806.3	4380
MB 836 Bb[1]	6 / S	305— 500	1000—1500	6 7/16	8 1/16	1806.3	4830
MB 836 Db[3]	6 / S	370— 650	1000—1500	6 7/16	8 1/16	1806.3	5050
MB 820 B	12 / SV	460— 700	1000—1500	6 7/16	8 1/16	3612.6	6180
MB 820 Bb[1]	12 / SV	610—1000	1000—1500	6 7/16	8 1/16	3612.6	6900
MB 820 Db[3]	12 / SV	770—1350	1000—1500	6 7/16	8 1/16	3612.6	7240
MB 837 A	8 / SV	165— 440	850—2000	6 1/2	6 7/16	1825	2940
MB 837 Aa[1]	8 / SV	240— 550	850—2000	6 1/2	6 7/16	1825	3020
MB 839 Ab[1]	16 / SV	1145—1800	1000—1500	7 1/2	9 1/16	6380	11020
MB 839 Bb[3]	16 / SV	1380—2350	1000—1500	7 1/2	9 1/16	6380	11450
MB 518 [1]	20 / SV	3000	1720	7 3/16	9 15/16	8201.5	10550

S = vertical; L = horizontal; V = vee type; [1] = supercharged; [2] = supercharged and with boost intercooling [3] = with high boosting and boost intercooling.

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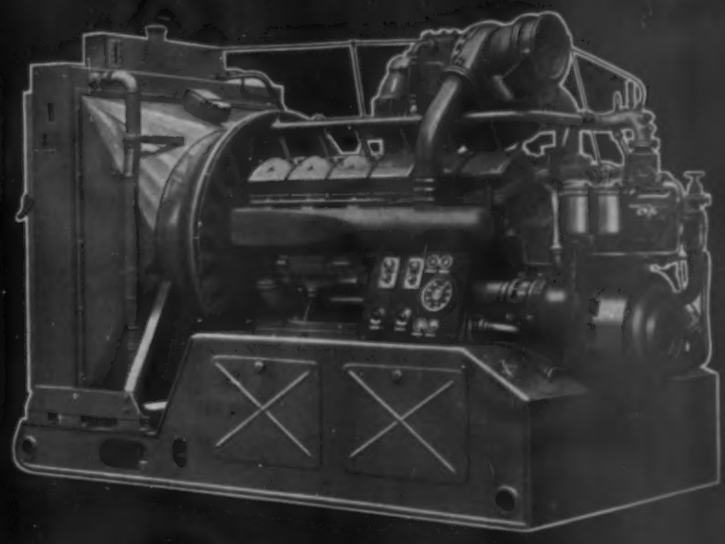

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MERCEDES-BENZ DIESEL

OIL COMPANY STAFF CHANGES

A. A. Curtice

F. R. Hall

ARTHUR A. "Duke" CURTICE has resigned as president and general manager of Signal Oil and Gas of Venezuela to resume work as a private petroleum consultant. With offices in Caracas, Venezuela, Mr. Curtice has headed the Signal Oil and Gas Co. subsidiary since March, 1957. The Venezuela company is operator of a large concession in Lake Maracaibo for itself and foreign subsidiaries of Signal, Pure Oil Co., and Standard Oil Co. (Ohio).

Mr. Curtice, internationally eminent geologist and petroleum engineer, was associated with Herbert Hoover, Jr. and Glen Ruby from 1942 to 1952, heading the firm of Hoover, Curtice and Ruby, S. A. During 1943-44 Mr. Curtice was a technical advisor and negotiator in the preparation of Venezuela's present petroleum law. Mr. Curtice's consulting operations will be headquartered at Suite 516, 630 5th Avenue, New York 20, N. Y.

S. T. PRUITT, formerly domestic sales manager, has been named general sales manager, of Ethyl Corp. **J. J. FREY,** assistant vice president, continues to direct export sales. **STUART FORBES** becomes domestic sales manager.

W. K. McCULLOCH has been named to the new post of sales manager for petroleum additives, with the exception of antiknock compounds.

C. F. NAYLOR has been named administrative assistant to the vice president in charge of sales. In other promotions, **D. S. FLYNN** succeeds Mr. Forbes as manager of the Central Region in Chicago, **R. D. BUSHELL** succeeds Mr. Flynn as assistant regional manager of the Eastern Region in New York, and **W. J. RUSHER** succeeds Mr. Bushell as manager of the New York district.

WILLIAM R. LOVE, director of the budget, Texaco Inc., has been appointed assistant comptroller—administration. **MAURY L. NEE,** assistant to the vice president in charge of Trinidad Operations, will succeed Mr. Love as director of the budget.

JOSEPH STEWART has been named an assistant director in the chemicals research division of Esso Research and Engineering Co. Mr. Stewart was previously in England on an assignment with Esso Research Ltd.

JOHN S. SPROWLS, vice president and assistant to the president, The Vickers Petroleum Co., Inc., has been elected a director. Formerly assistant treasurer of Gulf Oil Corp., Pittsburgh, Pa., Mr. Sprowls joined Vickers last September.

ROBERT D. BENT has been elected a director and vice president of The Atlantic Refining Co. He will continue as general manager of the firm's manufacturing department. As a new director, Mr. Bent will fill the unexpired term of W. F. Stroud, who retired last June and who has now resigned as a director.

R. D. Bent

D. W. Ramsey

FRANKLIN R. HALL has been elected president and director of Esso Standard Oil Co. (Uruguay) S. A. He succeeds William B. Brown, who died in August. Mr. Hall has been manager of the Southern Division of Esso do Brasil for the past three and one-half years.

JAS. D. HUGHES AND ASSOCIATES, specialists in sales consulting and market research, has opened offices at 4222 Richmond Avenue, Houston. Mr. Hughes headed the sales activities of Lane-Wells Co. for more than 19 years.

C. D. OWENS, Jr., manager of Industrial relations for Sinclair Oil & Gas Co., Tulsa, Okla., has been transferred to New York City, as assistant to Millard E. Stone, vice president and director of industrial relations for the Sinclair companies.

V. L. FROST, formerly exploration manager of the Oasis Oil Co. of Libya, a wholly-owned subsidiary of the Ohio Oil Co., has been assigned to the parent company's staff of the manager of exploration for foreign production. He will be headquartered at Ohio Oil's General Office, Findlay, Ohio. **B. B. COLLEY,** formerly exploration manager of the Continental Oil Co.'s Oklahoma City regional division, has been assigned to Oasis on a loan basis to succeed Mr. Frost. Oasis Oil Co. of Libya is the operator for Libyan Concessions for Ohio Oil, Continental and Amerada Petroleum Corp.

ROBERT B. STOKKE, who began his career with the Standard Oil Co. (New Jersey) organization in 1937, has been elected treasurer of Esso Export Corp. Since 1958, Mr. Stokke has been on a rotational training assignment with Jersey's marketing coordination department as regional coordinator for Latin America.

G. D. (Dan) ALMEN, JR., has been elected a vice president of Sinclair Oil Corp. Mr. Almen is also a director and vice president of Sinclair Oil & Gas Co. He will assist F. A. Bush, vice president and chief geologist of Sinclair Oil Corp.

G. D. Almen

J. A. Horner

J. A. HORNER has been elected president of Shell Pipe Line Corp. to succeed Joe T. Dickerson, who retired on January 1, after 33 years of service. Mr. Horner joined Shell at Tulsa in 1936 in the legal department. In 1944 he was a member of the group which planned the company's post war organization and expansion. In 1945 he became administrative assistant in the office of the Shell Oil Company president and was appointed secretary in 1953.

Mr. Horner has also been serving as vice-president of Shell Development Co. and secretary of Shell Chemical Corp., International Lubricant Corp., and Shell Canadian Exploration Co.

WALTER O. MILLER, superintendent of Continental Oil Co., Baltimore, Md., petrochemical plant, has been promoted to superintendent of the company's "Alfol" alcohol plant now under construction at Lake Charles, La. **T. J. KAROLENKO,** superintendent of both the company's Chicago, Ill., and Hammond, Ind., petrochemical plants, succeeded Mr. Miller as Baltimore superintendent. **J. H. McGINNIS,** assistant superintendent at Chicago was promoted to superintendent of both the Chicago and Hammond plants, succeeding Mr. Karolenko, and **E. J. KARWACKI,** Hammond, became assistant superintendent of both the Chicago and Hammond plants.

D. WOODSON RAMSEY, JR., coordinator of worldwide marketing activities of Standard Oil Co. (N. J.), has joined the new Humble Oil Refining Co. (Del.) as a vice president and director.

M. W. Johnson

G. W. Butler

M. W. JOHNSON has been appointed coordinator of the world-wide marketing activities of Standard Oil Co. (New Jersey) succeeding **D. W. RAMSEY** who joined Humble Oil & Refining Co. in Houston as vice president and director. He was succeeded by **G. W. BUTLER.** Mr. Butler has been assistant general manager of marketing for Esso Standard Oil Co. Mr. Johnson began his career in 1928 in New York. In 1938 he was made a division sales manager of West India Oil Co., now known as Esso Standard Oil, S. A., and in 1942 became general manager of the Panama regional office of that company. In 1948, Mr. Johnson was elected president and a member of the board of directors of Esso Standard do Brasil Inc., a post he held until his appointment as Jersey's deputy coordinator for marketing in 1958.

DON F. CARLOS of Houston has been appointed executive assistant to Thomas G. Kelliher, manager of Tidewater Oil Co.'s home office exploration department in Los Angeles. Mr. Carlos has served as Tidewater's Southern Division exploitation geologist since July, 1957.

DOUGLAS BALL, president of Ball Associates, toured Japan and Israel during the months of November and December. He advised Japanese gas companies on underground gas storage problems and in Israel, he consulted with the Israel Negev Petroleum Co. and the Naptha Co. on completion and treatment of wells in the new Zohar gas field.

MARVIN F. MILLER has been appointed manager of labor relations for Standard Oil Co. of California. The former assistant general manager of the company's Richmond refinery fills the post left vacant by the recent death of Harry R. Miller.

W. R. COOPER has been elected vice president in charge of engineering and construction, ARAMCO. Mr. Cooper, formerly general manager for engineering and construction, succeeds **L. M. SNYDER,** who recently was named vice president in charge of relations.

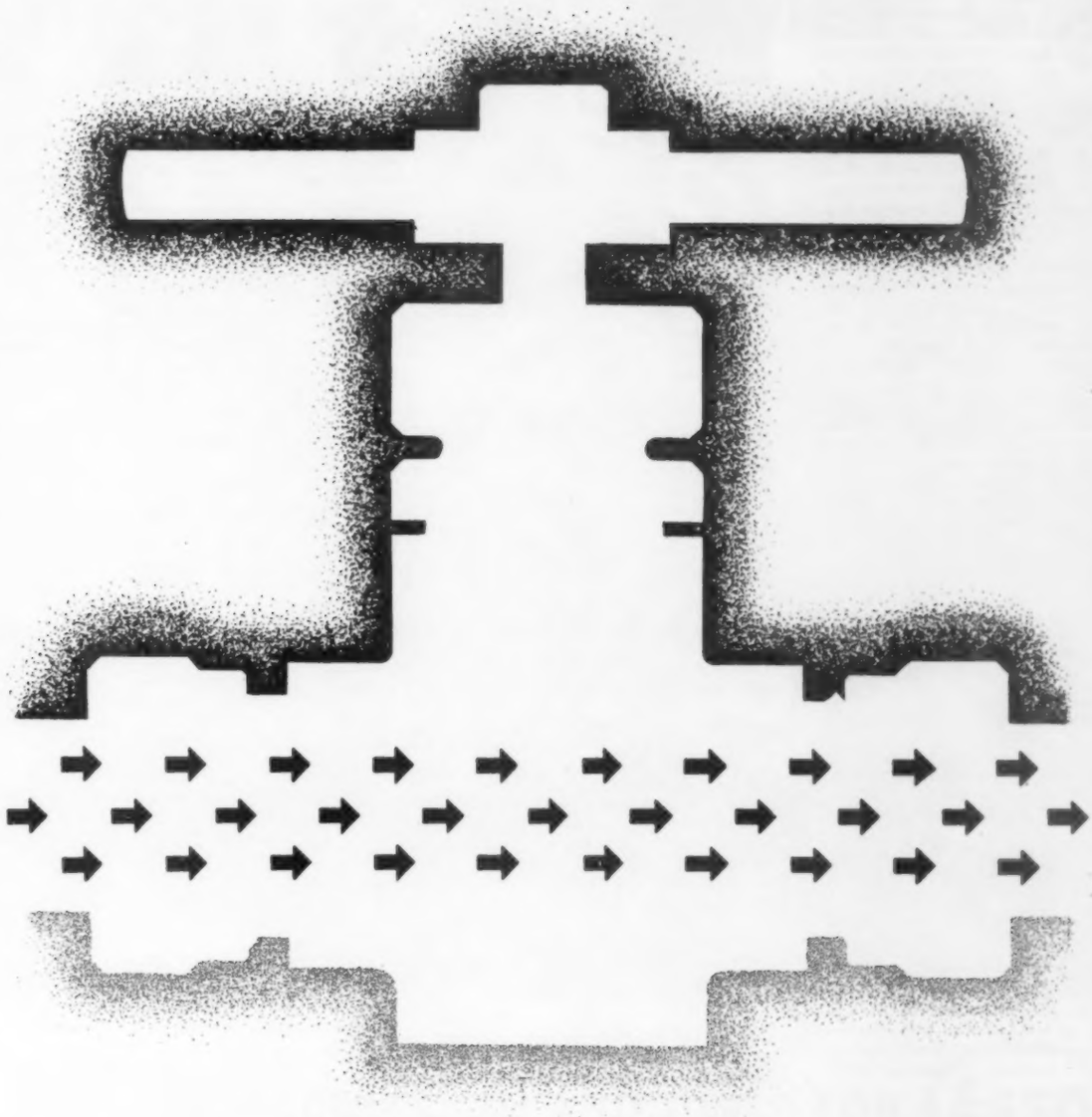
F. M. FILES has been named to coordinator of manufacturing for the international department of Phillips Petroleum Co. He will be located at the company's headquarters in Bartlesville, Okla., and will coordinate operations that include natural gas liquids plants and refineries in British Columbia, Canada, and San Roque, Venezuela.

CHARLES B. DUKE has been named manager of Sun Oil Co.'s newly-formed crude oil purchase and sales division. Also transferred to the new division are **D. E. NORRIS,** formerly crude oil salesman, and **ROBERT E. LEE,** previously manager of crude oil supply and transportation. Mr. Norris will handle sales and purchases of foreign crude and Mr. Lee, at Beaumont, Texas, will be in the domestic market.

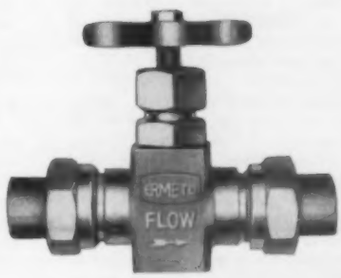
W. I. LEITZELL and **REX W. SMYTH** have joined the technical development section of the petrochemicals department, Gulf Oil Corp. Both men will assist in the planning and development of new projects for Gulf's expanding petrochemical activities.

SCOTT W. WALKER, assistant manager of research for Pan American Petroleum Corp., and for six years a faculty member at Massachusetts Institute of Technology, has been named dean of the College of Petroleum Sciences and Engineering at the University of Tulsa.

ARCHIE MILLER has been elected director and president and general manager of Duke Drilling Co. Ltd. In 1953 he was made superintendent and was general manager in 1957, a position which has now been combined with that of president.



In connection with high pressure



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MAYNARD I. LANDA has been elected a vice president of Cities Service Petroleum, Inc. Since 1953 he has been Petroleum Economics Coordinator for the Cities Service system. Mr. Landa joined the Cities Service organization as a junior engineer in 1919.

WILLIAM A. DENNISON has succeeded **FRED VAN COVERN** as director of the department of statistics of the American Petroleum Institute. Mr. Dennison, formerly manager of the Economic Research Section of the API's Committee on Public Affairs, was replaced by Peter Griskivich, assistant manager of the section.

Mr. Van Covern, who retired on Jan. 1 after more than 35 years with the API, will reach retirement age on March 31. He has, however, agreed to remain for an indefinite period. A native of Brooklyn, Mr. Van Covern entered the oil industry in 1917 with the Carter Oil Co. He later transferred to the foreign producing department, Standard Oil Co. (New Jersey).

HAROLD D. HOOPMAN, operations manager of The Ohio Oil Co. of Guatemala, has been appointed resident manager succeeding J. Patrick D'Artois, who died late in October. **ARTHUR H. PETSCH,** exploration manager for Ohio Oil of Guatemala, will retire and be succeeded by **CLARK M. CHIMEALL,** chief geologist.

Ohio Oil of Guatemala is operator of 1½-million acres of concessions held jointly by Ohio Oil of Guatemala and several other companies. The company's first test, now drilling in the interior, aroused considerable interest last year through its pioneer use of aircraft to fly more than 6 million pounds of drilling rig, equipment and supplies into a specially built airstrip deep in the jungle.

WILLIAM I. PATRICK has been elected president of Esso S.A.P.A., succeeding **B. G. TCHALIDY** who is retiring after 37 years of service in Argentina.

W. C. SMITH and **FRED P. SEWELL** have been elected senior vice presidents of Delhi-Taylor Oil Corp., Dallas. Formerly vice presidents in charge of specific operations, they now have broader areas of responsibility.

CHARLES D. SCHNAKE, former supervisor of publications for Sunray Mid-Continent Oil Co. in Tulsa, has been named public relations supervisor.

F. W. SPOONER is now manager of Shell Oil Co.'s national sales department. He has been assistant to the national sales manager since 1957.

STUART P. KING, senior vice president of Tennessee Argentina, S. A., a wholly-owned subsidiary of Tennessee Gas Transmission Co. of Houston, has assumed managership of the company's Argentine operations. **MARSHALL A. JEFFERS,** vice president of Tennessee Argentina, has been assigned as production manager for Argentine operations. Both men will establish their offices in Tennessee Argentina's headquarters at Buenos Aires.

K. H. SHAFFER has been appointed chairman and **J. E. GOSLINE** president of Standard Oil Co. of Texas. Mr. Shaffer will succeed to the presidency of the California Co., Standard's mid-continent operating company, upon the retirement in June of H. C. Teasdel, the current president.

Mr. Shaffer, president of Sotex since 1955, joined Standard of California in 1929. He previously served as assistant general manager of Standard's producing department in San Francisco and as director, vice president and assistant to the president of the California Co. in New Orleans.

Mr. Gosline has been director, vice president and assistant to the president of Calco since early 1958. He previously held assignments as general manager of Standard of California's producing department and as a special consultant on producing matters. He joined the company in 1933.

HOWARD G. VESPER, president of Standard Oil Co. of Calif., Western Operations, Inc., has been elected president of Western Oil and Gas Association. He succeeds Olen Lane of Continental Oil Co. Other officers elected were Howard C. Pyle, Monterey Oil Co., first vice president; George F. Getty II, Tidewater Oil Co., second vice president, and T. H. Wallace, Western Gulf Oil Co., treasurer. Felix Chappellet was re-elected secretary, vice president and general manager.

C. J. Angulo

Robt. Dyk

P. D. COLLINS and **C. J. ANGULO** have been elected directors of Esso Standard (Libya) Inc. Together with Robert A. Eeds, president and director, and H. W. Brown, executive vice president and director, Mr. Collins and Mr. Angulo will make their headquarters in Libya.

Mr. Collins came to Libya in 1957 as deputy general manager of the company, a position he held until his election as a director. He was graduated from Tulsa University as a geological engineer in 1943 and shortly thereafter joined the Arabian American Oil Co. in Saudi Arabia where he participated in the development of such major fields as Abqaiq and Ghawar.

Mr. Angulo, who has been assistant manager of the negotiations division of Jersey Standard's producing coordination department, is a 1941 graduate of Yale University, and has a master's degree from Harvard Business School and a law degree from Harvard Law School. In 1954, he was made general counsel of Jersey's affiliate, Esso Standard do Brasil, in Rio de Janeiro and, in 1957, returned to New York in the negotiations division of the producing coordination department.

JAMES D. WILLSON has been named controller of Tidewater Oil Co. Mr. Willson succeeds **RUSSELL D. RICHARDSON** as finance vice president and as a member of the executive management of the company.

GARTH L. YOUNG has been named president of Signal Oil and Gas of Venezuela to succeed **ARTHUR A. CURTICE,** resigned. Mr. Young is a director and vice president in charge of foreign operations of the parent Signal company. **R. C. VLACK** was appointed resident manager of the Latin American firm. He has been manager of operations in Maracaibo for the past two years. He will continue to make his headquarters in Maracaibo, and will now have overall responsibility for Signal's activities in Venezuela.

CLAUDE WILD, JR., has been appointed legislative representative for Gulf Oil Corp. in Washington, D. C. Mr. Wild's headquarters will be at 1001 Connecticut Avenue, N.W.

G. CURTIS MAYES has been appointed joint interests manager for Mobil International Oil Co., on Jan. 1. He will advise on producing matters related to the company's joint interests in the Middle East. Mr. Mayes has been with the Mobil group of companies since 1941. Most recently he has been assistant to the joint interests manager, **CHARLES W. BOUGHTON,** who retired Feb. 1 after 33 years with the company. Mr. Boughton has been a member of the producing committee. He spent most of his professional career overseas as a geologist in Peru, Sumatra (Indonesia) and Venezuela.

WINFIELD GIVENS, manager of Sun Oil Co.'s land department, retired Dec. 31 after 40 years of service. During his career Mr. Givens helped pioneer the company's production operations in Venezuela and Canada. He was a director and executive vice president of Sun's eight foreign production subsidiaries and an officer in two other Sun subsidiaries.

GRANT H. YOUNG has been elected vice president of marketing of The Ohio Oil Co. to succeed **NELSON T. STOVER,** who retired December 1.

SLOAN K. CHILDERS has been promoted to special representative and **W. W. LUNN** has been advanced to assistant foreign exploration director in Phillips Petroleum Co.'s international department. Both men will be headquartered in Bartlesville, Okla.

HOMER Z. MARTIN has been appointed coordinator of petroleum process research in Esso Research and Engineering Co.

J. P. McCabe

H. H. Neel

New Tidewater Foreign Division

Tidewater Oil Co. has formed a new operating division to contain its growing foreign exploration and production activities. The new division will direct Tidewater's exploration and production work in all foreign countries with the exception of the Iranian Consortium in Iran, and operations in Saskatchewan, Canada. General manager of the new division is Henry H. Neel, who headed a foreign exploration and production department before the formation of the company division. Mr. Neel has named Robert Dyk division exploration manager and John P. McCabe to the post of division production manager. Mr. Dyk was formerly chief geophysicist for Tidewater and Mr. McCabe has been serving as assistant to Tidewater's home office production manager.

CHARLES B. TOWILL has been appointed public relations manager for BP (North America) Ltd. **R. BRYAN COOPER,** who has completed nearly three years in New York for BP, has returned to London.

ALLAN L. PIPER has been appointed manager of Tidewater Oil Co.'s eastern division transportation and supply department and a member of the division's operating committee. He replaces **H. F. TOMFOHRDE,** who was recently named home office transportation manager at Los Angeles.

JAMES C. GILBERT has been named manager of land and exploration for Husky Oil Co.

JOHN H. McWILLIAMS succeeds Winfield Givens as manager of Sun Oil Co.'s land department. At the same time, Mr. McWilliams assumes the posts of vice president and director of Sun's nine foreign production subsidiaries. Mr. Givens retired as manager of the land department and as executive of the Sun subsidiaries last Thursday after 40 years of service with Sun.

CHARLES C. KENNEY

Charles C. Kenney, 51, assistant to the executive vice president of the Ohio Oil Co. died unexpectedly of coronary thrombosis recently. Mr. Kenney joined Ohio Oil in 1933 as a messenger and rose in June, 1958, to assistant to the executive vice president.

ROWLAND W. PHILLIPS

Rowland W. Phillips of The Texas Pipe Line Co., a subsidiary of Texaco Inc., died of a heart attack recently in his home at 17 Soundview Circle, White Plains, New York. He was 55 years old. He joined Texaco in 1934 as a draftsman. In 1953 Mr. Phillips was transferred to Texaco's New York office as assistant general manager of The Texas Pipe Line Co.

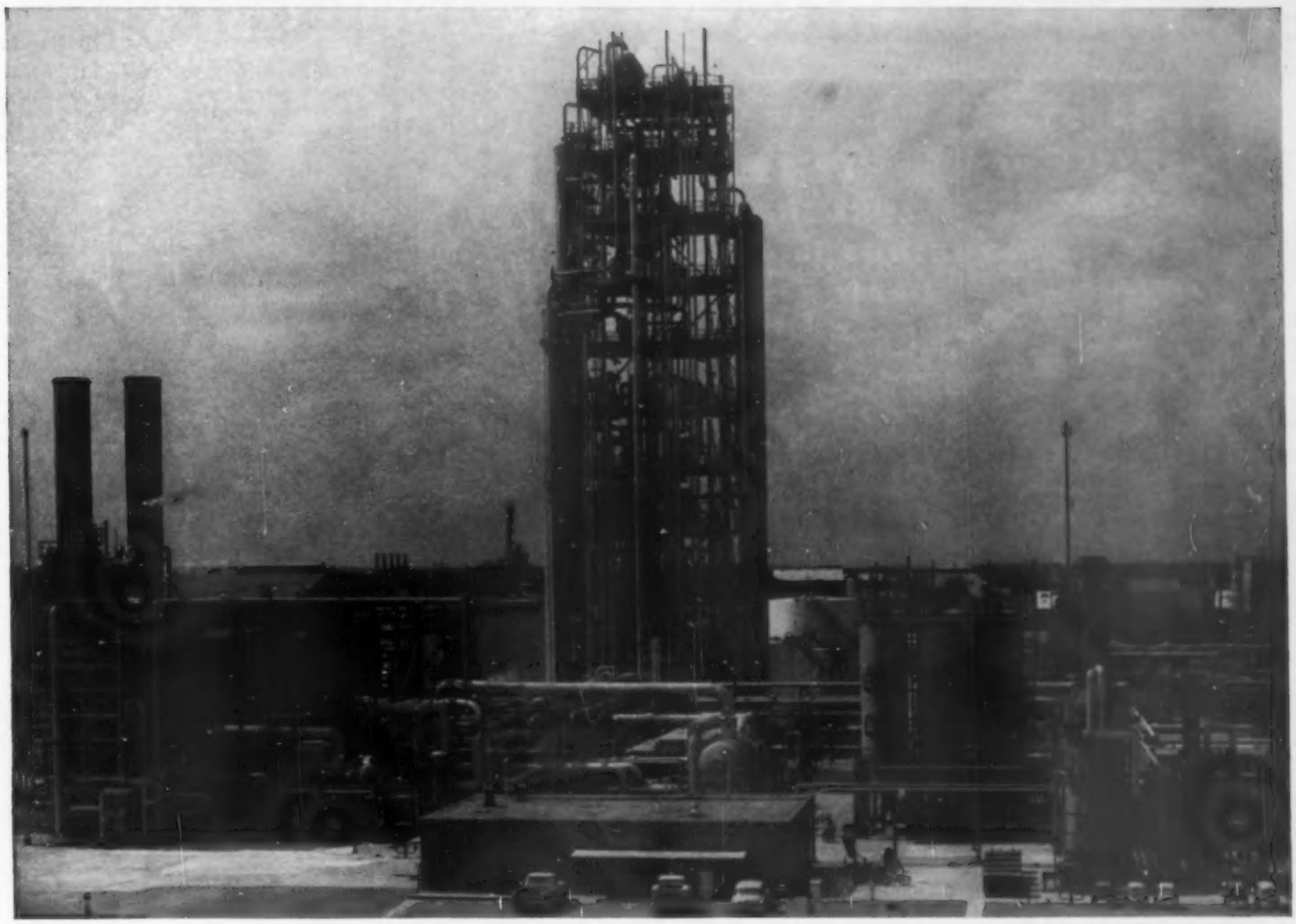
PATRICK D'ARTOIS

J. Patrick D'Artois, 51, resident manager of The Ohio Oil Co. of Guatemala, died recently in Guatemala City, Guatemala, of complications following a heart attack. He is survived by his wife, two sons, two daughters, and three sisters. Mr. D'Artois was graduated from law school in Shreveport, La., while on leave of absence from Ohio Oil. He rejoined the company in 1936 as an attorney. In 1955 he was appointed Ohio Oil representative to Conorada Petroleum Corp. in Guatemala and was named resident manager of Ohio Oil of Guatemala in 1956.

QUINTON S. PETERS

Quinton S. Peters, 40, assistant manager of public relations for Sunray Mid-Continent Oil Co., died in a Tulsa hospital recently after failing to recover from an operation for cancer of the stomach.

World's Largest Ethylene Unit



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Mobil Enters Sahara

Mobil International Oil Co., through one of its French affiliates, has signed a preliminary agreement with a French company, Compagnie d'Exploration Petroliere (CEP) and associated companies for a 25% interest in petroleum rights to approximately eight million acres in the French Sahara, located along the Libyan border of the Sahara, in the Department of the Oases, between the Edjele and Hassi Messaoud oil producing areas. Mobil and the CEP group plan an extensive exploration and development program to evaluate the petroleum rights area. CEP has conducted an exploration program in the area for the past several years and it will continue as operator for the new program.

CEP is owned 51% by the Bureau de Recherche de Petrole, and 49% by various public and private investment interests in France. Under the terms of the agreement, CEP will retain a 38% interest in the petroleum rights; its four associated companies, Francarep, Coparex, Eurafrep and Amif, will have 37%; and Mobil will acquire 25%, part of which will be held by Mobil's French affiliates. The contract between Mobil and CEP and its associated companies will be submitted to the French government for approval. Any crude oil that these companies may produce from the Sahara will be considered as French Community crude.

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India Accepts Offer

The offer of the West German government for participation in the exploration for oil in India under the Indo-German Technical Aid Program has been accepted by the Indian Government. West German seismic teams will conduct geophysical investigations in the Gangetic plain in Uttar Pradesh.

The offer of the French Petroleum Institute to conduct oil exploration in the Kutch area under the auspices of the Indian Oil and Natural Gas Commission is being examined by the Government.

Soviet Underwater Oil Depots

Underwater fuel depots now make it possible for Soviet merchant and navy vessels to refuel the high seas without having to call at foreign ports. The development of "solid" gasoline, fuel oil, etc., by Soviet scientists is said to make this procedure a simple affair.

Liquid fuel (gasoline, Diesel fuel, etc.) is blended with emulsifying agent consisting of spirit of ammonia (25%), casein, polyvinylalcohol, glycerine, and distilled water. One hundred liters (26.4 US gallons) of emulsion can be turned out in 5 to 6 minutes. The emulsion is then blended with hardening agents: formaline and a solution of oxalic acid. A press brings the "solid" fuel into the required shape, mostly into bricks. As such bricks may contain up to 13% of moisture, they are dried and the "solid" fuel brick is then ready for use.

A solid gasoline brick resembles in its structure a honeycomb. The fuel-filled cells have a diameter of about 0.00197"-0.000197". The brick is composed of 95% of liquid fuel and only 5% of emulsion.

The recovery of the fuel is done in a mixing machine. By this process the quality does not suffer, but 2%-3% of the fuel is lost. This apparatus may be synchronized with a motor so that only as much fuel is recovered as is required to feed the motor. "Solid" fuel has been stored under water, has been used by explorers in the Arctic, and by mountaineers in the Himalayas. It does away with tank cars, which generally run half of the time empty.

Soviets In Iraq

A group of Soviet geophysicists has begun seismic surveys in the Khanaqin area, Iraq, along the Iranian border. This region comprises the former concession areas of the Basrah Petroleum Comp., (I.P.C.), and of the Khanaqin Oil Comp., (B.P.).

USSR Completes Pipeline

The 315-mile Karadag (Azerbaijan)-Kirovabad-Akstafa-Tbilisi (Georgia) gas pipeline has been completed. A branch line is now being laid from Akstafa to Yerevan (Armenia). The third section of the Stavropol-Moscow gas pipeline is partly finished. Its diameter is 40", compared with 28" for the other two. From Rostov on, the diameter will be even greater, since the line from the Krasnodar fields will join there. The gas main Stavropol-Grozniy was also completed in the past month.

Sahara Loan by World Bank

The World Bank agreed to finance nearly half the cost of the $105 million French pipeline to carry Sahara oil to Western Europe. The loan, equivalent to $50 million, was made to Societe Petroliere de Gerance, jointly owned by the French Government and Compagnie Francaise des Petroles.

French Oil Finds

In The Parisian Basin, Régie Autocome des Pétroles, has completed a discovery well, Montmirail 2, producing light oil from the Upper Dogger between 1841/1851 meters. A step out is drilling.

The same company has a new important find in Villemer 101, northeast of Nemours and about 25 kilometers from the producing field of Chailly-en-Biére/Chartrettes. Light oil was produced from the Dogger formation, from two horizons around 1,520 meters. API gravity is 35.

Union, Kern County In Australia Hunt

Australian Oil and Gas Corp. will search for oil and gas in northern New South Wales and southwest Queensland in partnership with Union Oil Co. of California and Kern County Land Co., a California land and oil producing company.

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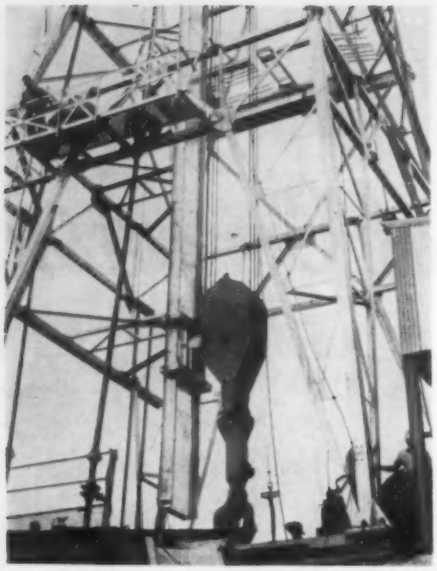
A5339

Derrick mounted on vessel consists of 16 sections with pin connections to withstand wave action. Photo courtesy Lee C. Moore Corp.

Derrick for Floating Vessel

A new type derrick, designed specifically for drilling from a floating vessel, has been developed by Lee C. Moore Corp., Tulsa, in conjunction with Zapata Off-Shore Co., Houston.

The new derrick has the same general dimensions as a standard size, conventional derrick (140′ high x 30′ square base); however, it differs in type of construction. The derrick is composed of 16 welded sections with pin connections, rather than having all individual members bolted together.



Vertical track prevents swaying of traveling block on floating drilling vessel.

The welded section design reduces the number of connections in the structure to a minimum, thus making it possible for the derrick to better withstand the reversal of forces imposed by the rolling action of a floating vessel.

Another unique feature of the derrick is a vertical track and roller device which acts as a guide to keep the traveling block from swinging.

The derrick is designed to withstand actual wind loads of 100 mph with a full pipe setback, and has a gross capacity of 952,000 lbs.

Tanker Accommodation Aft

The editors of WORLD PETROLEUM have received the following letter from Lester M. Goldsmith, formerly chief engineer for Atlantic Refining Co., who recently retired and now is engaged in consulting work at Philadelphia with offices in the Land Title Building:

"On Page 12 of the December issue of WORLD PETROLEUM there appears a photograph of an oil tanker with the title—'Tanker with all Accommodation Aft.'

"The explanation beneath the illustration proceeds to say 'is the first British-Built vessel of this type to have its entire accommodation, space and services at the after end.'

"I am sure you will be interested to know that thirty years ago The Atlantic Refining Company had built for their account by the Scott Shipbuilding & Engineering Co. of Greenock Scotland, three tankers named "Brunswick," "Permian" and "Winkler" — all three vessels with all accommodation aft.

"This was the original idea of the late Mr. J. W. Van Dyke who was then chairman of the board of Atlantic.

"Out of respect to his memory and his many pioneering efforts in the petroleum industry, I would appreciate your correction of the December article."

LESTER M. GOLDSMITH

Avondale Marine Ways Expansion

Major Changes Include Increased Yard Facilities, New Buildings. Avondale Marine Ways, Inc. has just completed a major expansion program at the Main Plant at Avondale, La. Included are facilities which will be used for cargo vessels and the Navy's guided missile detroyers. Three new 50-ton capacity Gantry Cranes have been erected and the railroad track system revised.

Gantry runs have been extended 2,560 ft to give full crane service to the building ways.

In addition to yard improvements, the engineering and research building has been enlarged and a large building for Avondale's customers and their inspectors has been erected. The present warehouse is to be enlarged and modified and an additional warehouse, containing a dehumidified storage area, is under construction.

Bethlehem Supply Expands

The Bethlehem Steel Co., Supply Division, has completed expansion of its Tulsa manufacturing facilities to include production of the Bethlehem line of duplex and triplex general purpose pumps and initial shipments of pumps are already underway.

The demand for triplex pumps for water injection in secondary recovery operations caused expansion in this direction. The duplex pump has been popular in salt water disposal, gathering systems and other applications. Triplex pumps are manufactured in 3″, 4″ and 6″ stroke sizes and duplex pumps in 3″, 6″ and 10″ sizes.

J. L. Pausch

H. Knippenberg

Dresser-Ideco Promotions

J. B. O'Connor, president of Dresser Industries, Inc. has announced two changes in the executive staff of Dresser-Ideco Co. of Columbus, Ohio. John L. Pausch has been elected chairman, and Henry Knippenberg president and general manager. The Dresser-Ideco Co. is a manufacturer of television towers, aircraft hangars, and other steel structures and buildings.

Solar Chicago Appointment

John W. Maybaum has been appointed assistant general sales manager of the Solar Chicago, division of U. S. Industries, Inc. He has been with Solar Chicago for three and one-half years as sales engineer and district sales manager. Prior to that time he has had ten years experience in design engineering and field erection of capital equipment for the process industries.

T. C. Williams

F. W. Argue

Stone & Webster Promotions

Stone & Webster Engineering Corp. has elected T. Cortlandt Williams as chairman. Fred W. Argue, executive vice president, was elected president to succeed Mr. Williams.

Other management changes effective Jan. 1 include the election of Alfred L. Hartridge, financial vice president and treasurer, as executive vice president, and of Dr. Arthur J. Good, vice president and comptroller, as vice president and treasurer.

H. R. Wells

A. L. Hartridge

Milwhite Names Wells

Mr. H. R. Wells has been elected executive vice president of production and properties for Milwhite Mud Sales Co., Houston, Texas. Mr. Wells is also a director of Milwhite. Some of the other recent positions held by Mr. Wells are assistant to chief engineer of Mississippi River Fuel Corp. (parent company of Milwhite Mud Sales Co.), vice president of Mobar Corp. (formerly production division of Milwhite Mud Sales Co.), and vice president of Milwhite.

Special Purpose Guns

Pan Geo Atlas Corp. has introduced four types of special guns including slot jet perforators, strip jet and fracture placement types. The slot jet perforator opens a hole ½″ by 3″ for completions in dense, low permeability formations, particularly for fracturing. The strip jet gun is made up of expendable jet charges on a steel carrier which is withdrawn from the well. New fracture placement types are designed a large number of performations on a single plane.

New MM&M

The board of directors of Manning, Maxwell & Moore, Inc. has elected John F. Reed executive vice president and director. John A. Flynn, controller, was elected a vice president. The company is a manufacturer of valves, pressure gauges, mechanical and electronic instruments, cranes, and hoists.

Oil Center Promotes Yancey

The promotion of J. R. (Dick) Yancey to vice president of the Oil Center Tool Co. has been announced by Al Woff, president. Mr. Yancey will continue to serve in his current role of chief engineer.

Jet-Powered Compressor Station

The Federal Power Commission has given approval of plans of Columbia Gulf Transmission Company for construction of a new jet-powered compressor station at Clementsville, Ky. It incorporates the new type 10,500 horsepower gas turbine being developed jointly by Cooper-Bessemer and Pratt & Whitney Aircraft. The revolutionary new turbine utilizes a modified J-57 jet aircraft engine as the power generator. The tremendous thrust of this gas-fueled unit is converted into rotating horsepower by a specially designed Cooper-Bessemer turbine which drives a Cooper-Bessemer centrifugal compressor. It is expected that the facilities will be completed in the Summer of 1960.

The New Tide in France

(Continued from page 50)

Sahara, C.F.P. made a costly effort to build new markets. With the new Jeanneney policy, C.F.P. looks grimly at the prospect of being forced into keen competition with its main shareholder, the State. Other major companies such as Shell, Esso, Mobil, B.P. are not happy to see the new drift in French policy. In some circles, we heard the opinion that the construction of new refineries in Strasbourg and elsewhere is now in question. Building of the south European pipeline may be affected.

As a matter of fact, reactions from many quarters have been so violent that the Ministry and the B.R.P. found it necessary to assure the industry that they only want to build up a small organization to insure outlets for Saharan oil in the national market. This latter statement is contrary to the fact that Mr. Jeanneney confirmed himself that he proposed to the Common Market organization to give a right of priority to Saharan oil. The French Minister for Industry explained that he asked France's partners in Brussels to establish a tariff on oil products, produced from imported crude or imported as such. Exemption from this tariff would be granted to national oils (German, Italian, Dutch, France including Sahara) and to a limited amount of other oils to cover the difference between European oil production and consumption.

This plan has not much chance to be accepted by France's partners in the Common market. But it is typical of what has been called, as a joke, "the new tide." This expression has recently been used for literature, movies or art and it is now used in petroleum circles ironically about the young technocrats who blindly advocate oil autarchy and nationalism.

Whatever the "new tide" will do in the future, it brings today a "wave of pessimism." When the news officially broke before Christmas, most of the oil shares became weak. All the economic and financial newspapers speak of "creeping nationalization." Foreign companies are disenchanted. Many think it might be well for the new tide to recede. END.

O. V. Tracy

R. H. Scholl

O. V. TRACY has been elected as president of Esso Standard Oil Co. to succeed William Naden and **ROBERT H. SCHOLL** has succeeded E. Duer Reeves as executive vice president.

Mr. Tracy has been a director of Esso Standard since 1954 and a vice president since 1956. From 1952 until last year, he was president of the Enjay Co., Inc., petrochemicals marketing affiliate. Mr. Scholl has been an Esso vice president and director since 1954. He joined Esso as a member of its law department in 1937, was named associate general counsel in 1946 and general counsel in 1949.

World Petroleum Statistics

FREE WORLD SUPPLY AND DEMAND, CRUDE AND PRODUCTS, MAY 1959

(Thousands of barrels)

Source: USA Bureau of Mines, Division of Petroleum.

Country	CRUDE PETROLEUM: Production	Imports	Exports and reexports	Stock change, other demand, and loss	Total 1/ refinery input / Total 2/ refinery output	REFINED PRODUCTS: Imports	Exports and reexports	Apparent domestic demand (incl. bunkers)	Bunkers-all flags (as reported)
NORTH AMERICA									
Canada	13,765	7,710	541	-385	21,402	2,411	45	3/20,339	
Mexico	8,223	-	-	-373	9,092	593	975	8,710	
United States (incl. Alaska)	223,806	29,089	267	+7,839	255,062	16,885	7,067	3/255,651	6,959
Subtotal	245,794	36,799	808	+7,241	285,556	19,889	8,087	284,700	
CENTRAL AMERICA AND CARIBBEAN									
Costa Rica	-	-	-	-	-	2/113	-	113	
Cuba	16	2,435	-	+96	2/2,375	2/366	2/-	2,741	
Dominican Republic	-	-	-	-	-	2/105	-	105	
El Salvador	-	-	-	-	-	2/144	-	144	
Guatemala	-	-	-	-	-	2/249	-	249	
Haiti	-	-	-	-	-	2/49	-	49	
Jamaica	-	-	-	-	-	2/76	-	476	
Nicaragua	-	-	-	-	-	2/90	-	90	
Panama, Canal Zone	-	-	-	-	-	2/359	2/173	186	2/384
Panama, Republic	-	-	-	-	-	2/173	-	173	
Puerto Rico	-	1,217	-	-397	2,413	243	1,173	1,483	
Subtotal	16	4,372	-	-301	4,788	2,627	1,346	6,069	
SOUTH AMERICA									
Argentina	3,570	2,694	-	-170	6,442	1,602	-	3/7,380	139
Bolivia	276	-	100	-12	188	9	1	196	
Brasil	2,061	4,488	620	+970	4,959	1,690	-	6,649	
Chile	340	204	-	-71	615	2/595	-	1,410	
Colombia	4,891	-	2,250	-40	8,181	-	582	3/4,508	
Ecuador	239	-	89	-68	218	19	-	237	
Netherlands Antilles	-	18,210	-	-1,037	2/21,284	2/2,381	2/17,167	6,498	
Paraguay	-	-	-	-	-	2/68	-	68	
Peru	1,485	-	45	+85	1,372	2/-	123	1,249	36
Trinidad	3,382	2,771	410	+44	2/5,735	2/49	2/2,848	2,936	1,234
Uruguay	-	555	-	-79	634	135	-	769	
Venezuela	79,607	-	58,346	-1,577	22,898	2/47	18,438	3/3,286	1,357
Subtotal	95,511	28,922	61,860	-2,763	66,666	6,595	39,099	38,808	
WESTERN EUROPE									
Austria	1,438	2/300	840	-299	1,197	566	135	1,628	
Belgium and Luxembourg	-	4,900	-	+76	4,824	993	1,548	4,269	
Denmark	-	97	-	+76	21	2,037	5	2,053	135
Finland	-	613	-	+13	2/600	585	-	1,185	
France	940	17,010	-	+187	17,763	1,032	4,373	14,422	
Germany, West	3,160	10,319	-	+1,313	12,166	3,004	4,587	13,583	
Greece	-	983	-	-96	1,019	138	-	1,151	
Iceland	-	-	-	-	-	497	-	497	
Ireland	-	-	-	-	-	738	-	738	
Italy	874	13,164	183	-1,475	15,436	311	3,804	11,943	
Netherlands	1,053	4,782	-	-2,940	2/9,477	1,596	5,796	5,277	556
Norway	-	113	-	+97	16	1,862	-	1,878	
Portugal	-	800	-	-15	835	886	69	1,652	
Spain	-	2,621	-	+367	2,320	2/78	-	2,398	
Sweden	-	1,427	-	+127	2/1,300	5,332	149	6,483	
Switzerland	-	-	-	-	-	2,035	-	2,035	
United Kingdom	51	27,218	-	+1,532	25,737	8,106	4,463	3/23,744	2,454
Yugoslavia	353	2/420	-	-1	774	2/50	2/151	673	
Subtotal	7,869	84,727	963	-1,030	93,505	29,854	22,082	98,081	
MIDDLE EAST									
Aden	-	2,306	-	-556	2/2,862	972	1,015	2,819	
Bahrain	1,396	3,513	-	-48	4,957	88	4,904	81	378
Iran	30,476	-	20,521	-391	2/10,346	-	7,036	3,310	
Iraq	24,815	-	2/23,615	2/-	2/1,200	-	-	1,200	
Israel	62	2/788	-	2/-	2/850	297	-	1,147	
Jordan	-	-	-	-	-	88	-	88	
Kuwait	44,645	-	39,511	+1,154	3,980	48	1,974	2,054	1,678
Lebanon	-	2/926	-	-	2/586	2/23	-	949	
Neutral Zone	3,600	-	2/2,900	+100	2/600	2/-	2/440	160	
Qatar	5,226	-	2/5,210	-	2/16	2/-	2/-	16	
Saudi Arabia	32,613	-	27,861	-848	5,000	11	3,693	1,318	
Turkey	230	-	-	-22	252	498	-	710	
U.A.R., Syria	-	-	-	-	-	533	-	533	
Subtotal	143,063	7,133	119,618	-11	30,589	2,658	19,062	13,965	
AFRICA									
Algeria	497	-	429	+68	-	2/725	-	3/991	
Angola	25	-	-	-10	33	64	-	99	
Belgian Congo	-	-	-	-	-	245	-	245	
Canary Islands	-	1,797	-	+148	1,650	90	801	1,739	
Ethiopia	-	-	-	-	-	2/94	-	94	
States formerly in French Equatorial Africa	451	-	451	-	-	2/80	-	80	
French West Africa	-	-	-	-	-	2/339	-	339	
Ghana	-	-	-	-	-	226	-	226	
Kenya	-	-	-	-	-	578	92	486	
Liberia	-	-	-	-	-	2/32	-	32	
Madagascar	-	-	-	-	-	2/51	-	51	
Morocco	58	-	-	-47	105	323	-	428	
Nigeria	279	-	2/279	-	-	306	-	306	
Rhodesia & Nyasaland	-	-	-	-	-	2/316	-	316	
Sudan	-	-	-	-	-	259	-	259	
Tanganyika	-	-	-	-	-	311	35	276	
Tunisia	-	-	-	-	-	217	-	3/254	
Uganda	-	-	-	-	-	79	14	65	
Union of South Africa	-	887	-	+49	838	1,340	103	2,075	
U.A.R., Egypt	1,765	2/1,064	529	2/-	2/2,300	2/805	2/18	3,087	
Subtotal	3,075	3,748	1,688	+206	5,128	6,480	663	11,048	
SOUTH ASIA, FAR EAST, AND OCEANIA									
Australia	-	6,224	-	+179	6,298	806	747	6,357	
British Borneo	3,317	-	2/1,967	2/-	2/1,350	89	1,582	57	
Burma	349	-	-	+32	317	2/57	-	374	
Ceylon	-	-	-	-	-	644	2	642	
India	264	-	-	-2,967	2/3,231	2/2,694	2/102	5,783	
Indonesia	10,540	2/913	4,393	2/-	2/7,481	2/358	2/3,119	4,722	
Japan	232	10,980	-	-239	11,451	1,773	180	13,044	
Korea, South	-	-	-	-	-	36	-	36	
Malaya and Singapore	-	271	461	-190	-	3,439	1,392	2,047	
Netherlands New Guinea	136	-	136	-	-	-	-	-	
New Caledonia	-	-	-	-	-	2/31	-	31	
New Zealand	-	-	-	-	-	5,369	-	5,369	
Pakistan	185	-	-	+21	164	2/1,070	2/-	1,234	
Philippines	-	789	-	+28	761	2/562	-	1,863	
Thailand	-	-	-	-	-	464	11	453	
Taiwan	1	784	-	+134	591	670	-	1,861	
Vietnam, South (includes Cambodia)	-	-	-	-	-	2/272	-	272	
Subtotal	15,024	19,941	6,957	-3,008	31,586	18,234	6,875	48,945	
WORLD TOTAL EXCLUDING EASTERN EUROPE, U.S.S.R., & MAINLAND CHINA	510,352	185,542	191,894	+334	517,818	85,537	97,014	486,636	

1/ Estimate based on latest available data.
2/ Total input includes crude runs to stills plus runs of other unfinished oils, topped crude and natural gas liquids blended.
3/ Total output includes refined product output plus refinery fuel and loss.
4/ Domestic demand as reported, including stock changes.

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Tobias, O'Neil & Gallay, Inc.

CENTER SEAT FOR OPERATOR — Sitting in seat located directly over center of machine, operator can keep casing lined up perfectly with hole being bored.

REVERSE-O-MATIC TRANSMISSION — With this new type transmission, operator can switch auger from forward to reverse without engine slowdown. No gear shifting.

HEAVY DUTY TORQUE CONVERTER — For full, constant speed and smooth power flow, eliminating up to 90% of shock load imposed on drive train.

The new Crose Road Boring Machine provides the fastest, simplest, most economical way for boring crossings and installing casings up to and including 42" in diameter. Heavy duty torque converter and reverse-o-matic transmission deliver full, constant speed and smooth power flow . . . let you switch auger from forward to reverse without engine slowdown . . . no gear shifting.

The smaller Model RBA Crose Road Boring Machine is still available for casing up to 24".

WRITE CROSE TODAY FOR COMPLETE INFORMATION

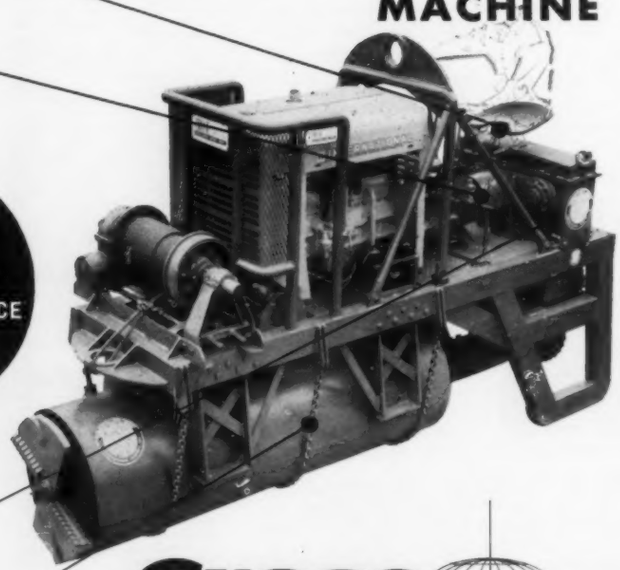
NEW GEAR AND CHAIN BOX — With pressure lubrication feature — has been added to the new Crose Road Boring Machine for greater power capacity.

CASING CLAMP BANDS ELIMINATED — Instead, you use adjustable casing chains which can be easily installed or removed when machine is in ditch.

CROSE

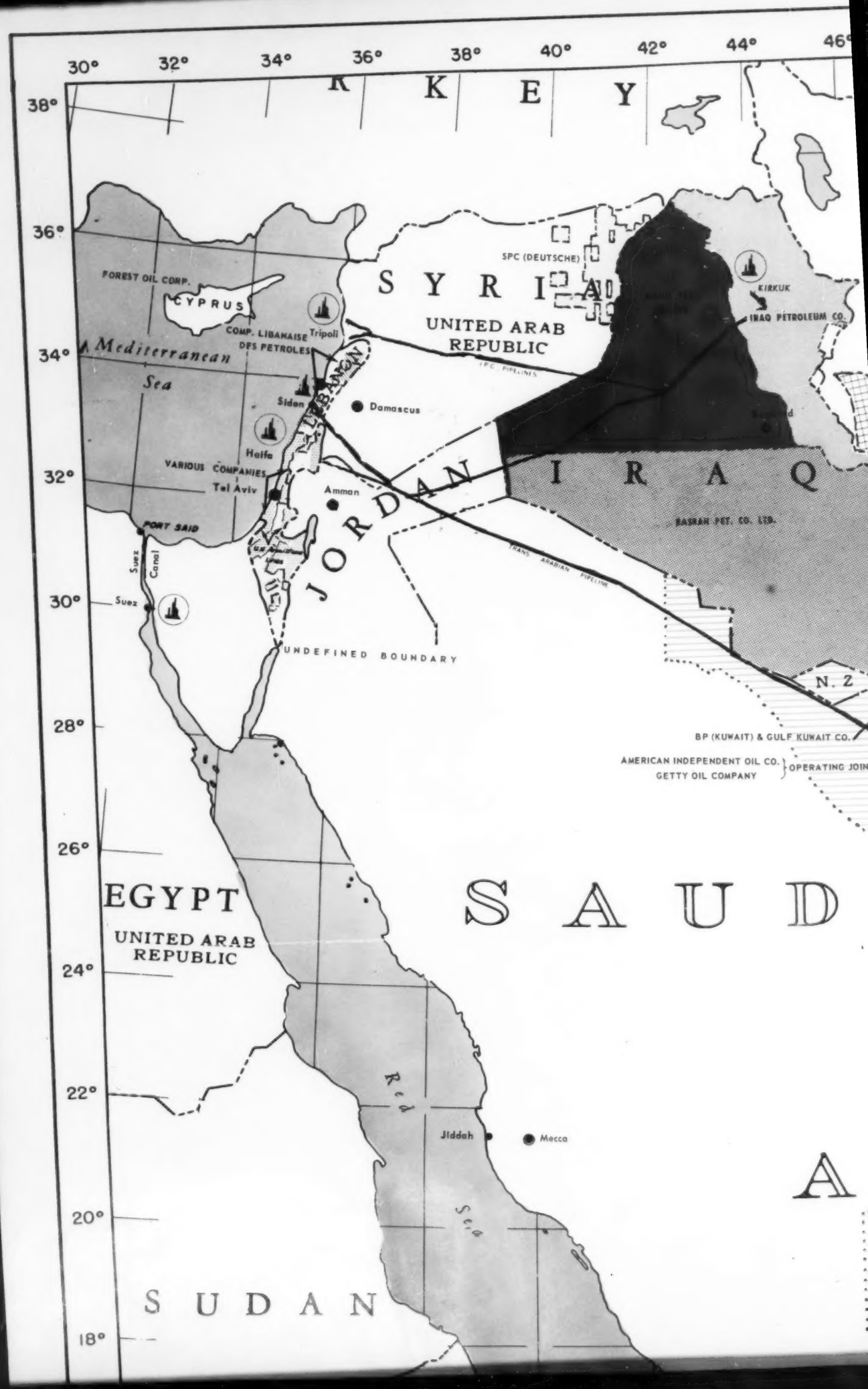
NEW ROAD BORING MACHINE

FIELD-TESTED TOP PERFORMANCE



Crose perrault EQUIPMENT CORP.

2765 Dawson Road • Phone WEbster 6-2171 • Tulsa, Oklahoma •
BRANCH OFFICES: Houston, Texas • Elizabeth, N. J. • IN CANADA:
Edmonton, Alberta • Toronto, Ontario • EXPORT OFFICE: New York, N. Y.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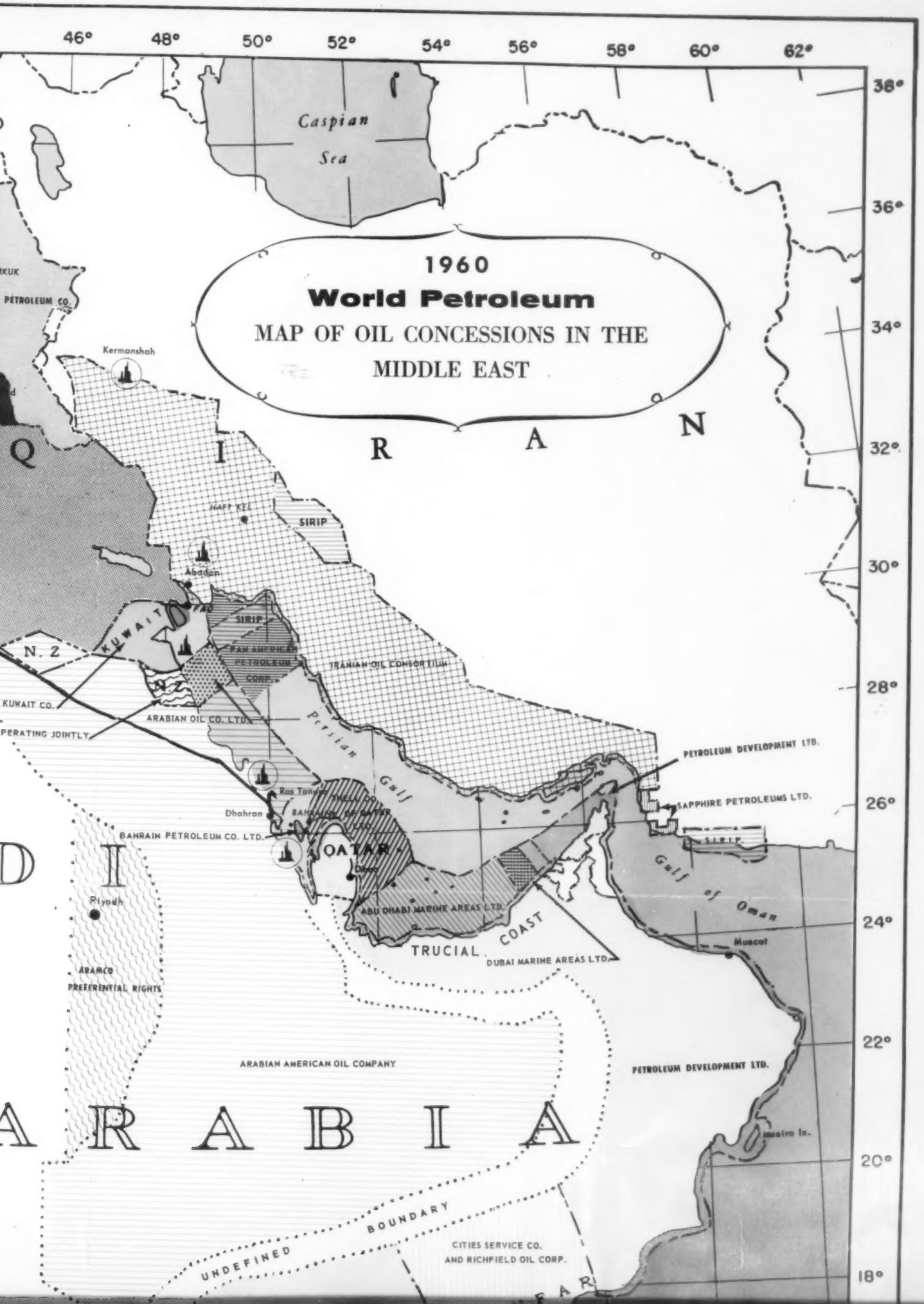
KEY
SYRIA
UNITED ARAB REPUBLIC
SPC (DEUTSCHE)
KIRKUK
IRAQ PETROLEUM CO.
FOREST OIL CORP.
CYPRUS
COMP. LIBANAISE DES PETROLES
Tripoli
Mediterranean Sea
LEBANON
Sidon
Damascus
Haifa
VARIOUS COMPANIES
Tel Aviv
Amman
JORDAN
IRAQ
BASRAH PET. CO. LTD.
PORT SAID
Suez Canal
Suez
TRANS ARABIAN PIPELINE
UNDEFINED BOUNDARY
N. 2
BP (KUWAIT) & GULF KUWAIT CO.
AMERICAN INDEPENDENT OIL CO.
GETTY OIL COMPANY
OPERATING JOIN
EGYPT
UNITED ARAB REPUBLIC
SAUD
Red Sea
Jiddah
Mecca
A
SUDAN


1960
World Petroleum
MAP OF OIL CONCESSIONS IN THE MIDDLE EAST
Caspian Sea
Kermanshah
SIRIP
Abadan
KUWAIT
N. Z
KUWAIT CO.
ARABIAN OIL CO. LTD.
IRANIAN OIL CONSORTIUM
Persian Gulf
Ras Tanura
Dhahran
BAHRAIN PETROLEUM CO. LTD.
QATAR
Doha
ABU DHABI MARINE AREAS LTD.
TRUCIAL COAST
DUBAI MARINE AREAS LTD.
PETROLEUM DEVELOPMENT LTD.
SAPPHIRE PETROLEUMS LTD.
Gulf of Oman
Muscat
Masira Is.
Riyadh
ARAMCO PREFERENTIAL RIGHTS
ARABIAN AMERICAN OIL COMPANY
UNDEFINED BOUNDARY
CITIES SERVICE CO. AND RICHFIELD OIL CORP.
46°
48°
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MIDDLE AND NEAR EAST OIL CON

ADEN

Petroleum Concessions Ltd., subsidiary of Iraq Petroleum Co. Ltd. Exploration permit covers entire nation, including Hadramaut & Socotra island.

BAHRAIN ISLAND

Bahrain Petroleum Co. Ltd. Company owned equally by The Texas Co. and Standard Oil Co. of California. Concession covers all Bahrain and territorial waters, area about 1,700 square miles. Expires 2024.

DHOFAR

Dhofar-Cities Service Petroleum Corp. Subsidiary of Cities Service Oil Co. Concession covers about 30,000 square miles. Richfield Oil Corp. has 50% working interest.

JORDAN

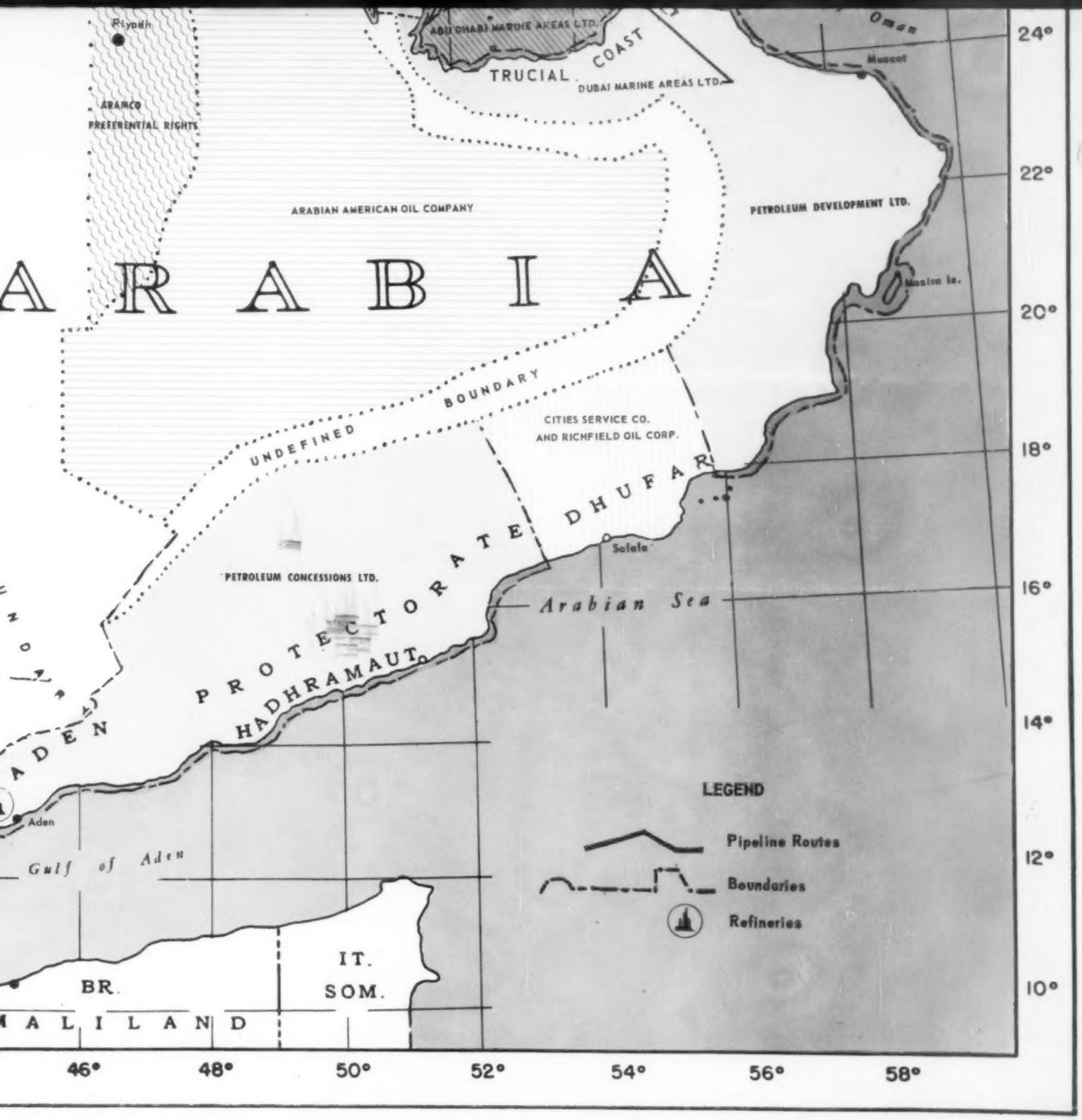
Phillips Petroleum Co. Pauley Petroleum Co. reserved 9.6% net profits royalty interest.

Israel National Oil Co. Ltd.
Israel Oil Prospectors Corp. Lt
Israel American Oil Corp.

IRAN

Iranian Oil Participants, Ltd. under a
Iranian Oil Co. Iranian Oil Explorat
25 years from 1954, expires 1979;
100,000 square miles. Ownership:

British Petroleum Co., Ltd. ....
Royal Dutch/Shell group .....
Compagnie Francaise des Pé
Standard Oil Co. (N. J.) .....
Standard Oil Co. of Californi
The Texas Co. .....



CONCESSION OWNERSHIP — EAST OF SUEZ

il Co. Ltd.
tors Corp. Ltd.
Oil Corp.

Ltd. under agreement with government of Iran and National Oil Exploration and Producing Co.—operator. Agreement: xpires 1979; plus 15 years optional. Area: Approximately Ownership:

Co., Ltd.	40%
l group	14%
caise des Pétroles	6%
(N. J.)	7%
of California	7%
	7%

with 2-year renewal option and 40-year exploitation lease from date of commercial production. Area: Saudi Arabia's undivided half-interest in offshore area of Saudi Arab-Kuwait Neutral Zone, extending from 6 miles off coast into Persian Gulf to median line between Iran and Neutral Zone, including islands and adjacent waters. Ownership: Japan Petroleum Trading Co., Ltd., 100%.

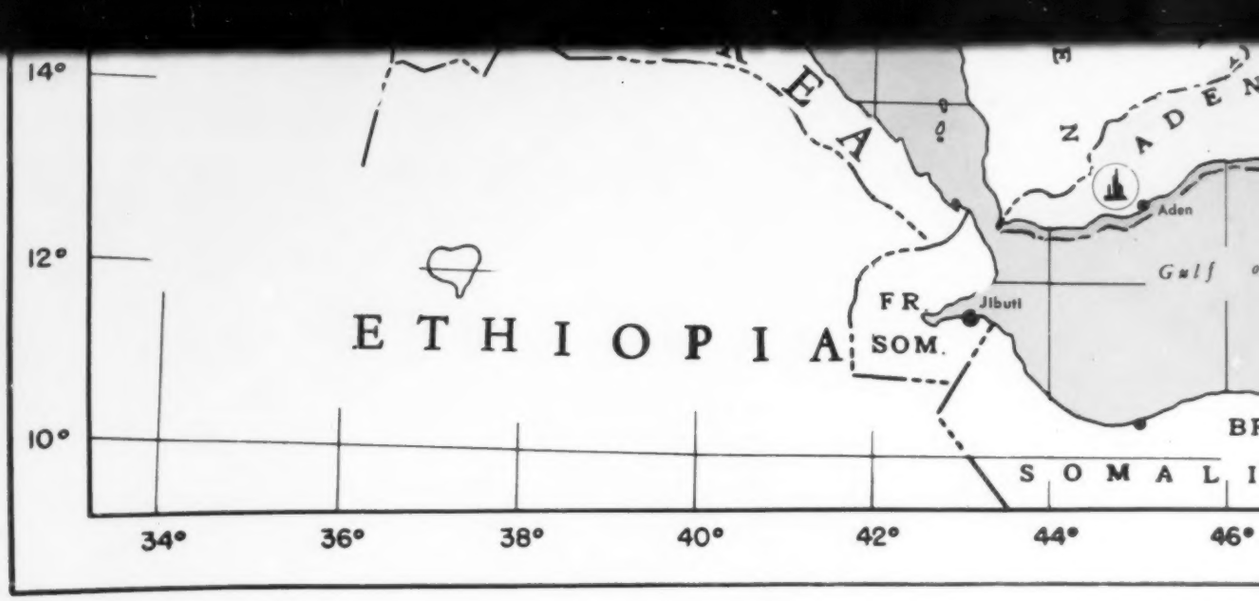
QATAR

Qatar Petroleum Co., Ltd. Subsidiary of Iraq Petroleum Co. (IPC). Concession covers all of Qatar including territorial waters to 3-mile limit. Expires 2010.

QATAR OFFSHORE

Anglo Saxon Petroleum Co. Ltd. (Shell). Concession covers continental shelf offshore from Qatar beyond 3-mile limit. Expires 2027.

SAUDI ARABIA



MIDDLE AND NEAR EAST OIL CONC

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DHOFAR

Dhofar-Cities Service Petroleum Corp. Subsidiary of Cities Service Oil Co. Concession covers about 30,000 square miles. Richfield Oil Corp. has 50% working interest.

JORDAN

Phillips Petroleum Co. Pauley Petroleum Co. reserved 9.6% net profits royalty interest. Concession covers one-third of country.

KUWAIT

Kuwait Oil Co. Ltd. Subsidiary BP (Kuwait) Ltd. (British Petroleum) and Gulf Kuwait Co. (Gulf Oil Corp.). Owned equally. Covers all of Kuwait and territorial waters, about 6,000 square miles. Expires 2026.

IRAQ

Basrah Petroleum Co. Ltd. Subsidiary of Iraq Petroleum Co. Concession covers southern part of Iraq—all territory not covered by IPC, Mosul and Khanaqin concessions. Expires 2013.

Iraq Petroleum Co. Ltd. Concession covers provinces of Baghdad and Mosul (east of Tigris River—except former Khanaqin concession), about 32,000 square miles. Expires 2000:

Ownership:

Anglo-Saxon Petroleum Co. Ltd. (Shell)	23.75%
British Petroleum Co. Ltd.	23.75%
Cie. Francaise des Petroles (French Gov't)	23.75%
Near East Development Corp. (Standard (N. J.) and Mobil Oil Co.)	23.75%
Participations and Explorations Corp. (C. S. Gulbenkian Estate)	5.00%

Mosul Petroleum Co. Ltd. Subsidiary of Iraq Petroleum Co. Ltd. Concession covers all Iraq west of the Tigris River and north of 33° Latitude, approximately 40,000 square miles. Expires 2007.

ISRAEL

Israel has granted a number of exploration licenses and one exploitation right as of August 1959 to various individuals and companies. Companies are:

- Lapidoth Israel Pet. Co. Ltd.
- Israel Continental Oil Co. Ltd.
- Sharon Oil Corp.
- Naphtha Israel Petroleum Corp.
- Yehuda Israel Petroleum Co.
- Universal Petroleum Corp.
- Israel National Oil Co. Ltd.
- Israel Oil Prospectors Corp. Ltd.
- Israel American Oil Corp.

IRAN

Iranian Oil Participants, Ltd. under agre Iranian Oil Co. Iranian Oil Exploration 25 years from 1954, expires 1979; p 100,000 square miles. Ownership:

British Petroleum Co., Ltd.	
Royal Dutch/Shell group	
Compagnie Francaise des Pétro	
Standard Oil Co. (N. J.)	
Standard Oil Co. of California	
The Texas Co.	
Gulf Oil Corp.	
Socony Mobil Oil Co.	
Iricon Agency, Ltd.	
Richfield Oil Corp.	
Signal Oil and Gas Co.	
American Independent C	
Standard Oil Co. (Ohio)	
Getty Oil Co.	
The Atlantic Refining Co.	
Tidewater Oil Co.	
San Jacinto Petroleum C	

MUSCAT & OMAN

Petroleum Development (Oman) Ltd. (IPC

NEUTRAL ZONE

American Independent Oil Co. Owner Gas Co.; Ashland Oil and Refining Co. Mid-Continent Oil Co.; Globe Oil and R Corp.; Pauley Petroleum Inc. Concession half interest in Neutral Zone and terri pires 2008.

Getty Oil Co. Concession covers all of in Neutral Zone. Expires 2009. Owners holders 19%.

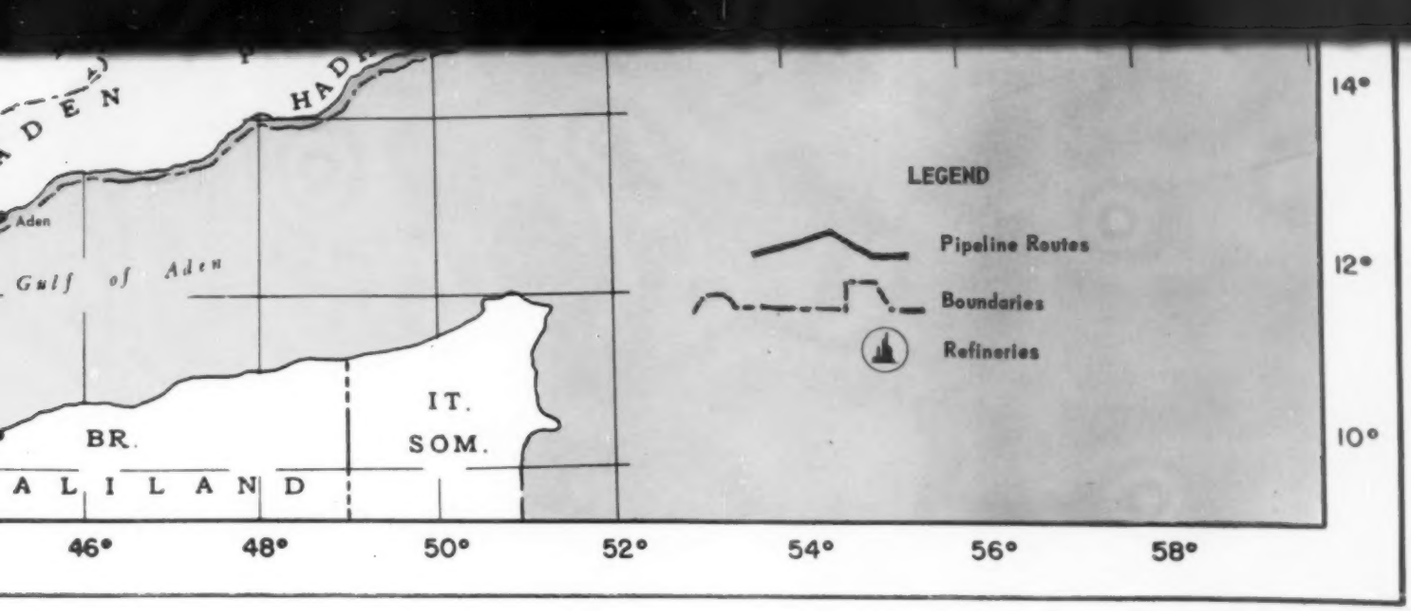
NEUTRAL ZONE—OFFSHORE

Arabian Oil Co., Ltd. Concession: 44½ Kuwait's undivided half-interest in offsh extending from 6 miles off coast into mined. Ownership: Arabian Oil Co. Ltd

NEUTRAL ZONE—OFFSHORE

Japan Petroleum Trading Co., Ltd. Con

Additional copies may be obtained from World Petroleu



CONCESSION OWNERSHIP — EAST OF SUEZ

Co. Ltd.
rs Corp. Ltd.
Corp.

d. under agreement with government of Iran and National il Exploration and Producing Co.—operator. Agreement: ires 1979; plus 15 years optional. Area: Approximately wnership:

., Ltd.	40%
group	14%
se des Pétroles	6%
N. J.)	7%
f California	7%
	7%
	7%
Co.	7%
	5%
l Corp.	1.250%
and Gas Co.	0.834%
dependent Oil Co.	0.833%
il Co. (Ohio)	0.417%
o.	0.417%
Refining Co.	0.417%
Oil Co.	0.417%
Petroleum Corp.	0.417%

man) Ltd. (IPC). Expires 2012.

l Co. Ownership: Phillips Petroleum Co.; Signal Oil and Refining Co.; Ralph K. Davies; J. S. Abercrombie; Sunray obe Oil and Refining Co.; Lario Oil and Gas Co.; Crescent c. Concession covers all of the Shaikh of Kuwait's undivided one and territorial waters, about 1,190 square miles. Ex-

covers all of King of Saudi Arabia's undivided half interest 009. Ownership: J. Paul Getty Interests 81%, other share-

RE

cession: 44½ years from July 5, 1958. Area: Shaikh of erest in offshore area of Saudi Arab-Kuwait Neutral Zone, f coast into Persian Gulf. Precise boundaries to be deter-n Oil Co. Ltd. (Japan Petroleum Trading Co., Ltd.) 100%.

RE

Co., Ltd. Concession: 2-year exploration license from 1958 with 2-year renewal option and 40-year exploitation lease from date of commercial production. Area: Saudi Arabia's undivided half-interest in offshore area of Saudi Arab-Kuwait Neutral Zone, extending from 6 miles off coast into Persian Gulf to median line between Iran and Neutral Zone, including islands and adjacent waters. Ownership: Japan Petroleum Trading Co., Ltd., 100%.

QATAR

Qatar Petroleum Co., Ltd. Subsidiary of Iraq Petroleum Co. (IPC). Concession covers all of Qatar including territorial waters to 3-mile limit. Expires 2010.

QATAR OFFSHORE

Anglo Saxon Petroleum Co. Ltd. (Shell). Concession covers continental shelf offshore from Qatar beyond 3-mile limit. Expires 2027.

SAUDI ARABIA

Arabian American Oil Co. Ownership: Standard Oil of Calif., 30%; The Texas Co., 30%; Standard Oil Co. (N. J.), 30%; Socony-Vacuum Oil Co. Inc., 10%. Original concession covers approximately 440,000 square miles in eastern Saudi Arabia. Preferential rights granted in central part of country. Original concession expires 1999. Additional area including continental shelf off-shore in Persian Gulf expires 2005.

SYRIA (U.A.R.)

Societe des Petroles Concordia S.A.R.L. Exploration Permit: Area: 49 rectangles with an area of 538.5 square miles in Syrian Province of United Arab Republic. Ownership:

Deutsche Erdoel Aktiengesellschaft	80%
Geberhardt & Koening—Deutsche Schachtbau G.M.B.H.	10%
Dea-Schliemann Mineraloelgesellschaft G.M.B.H.	10%

TRUCIAL COAST

Petroleum Development (Trucial Coast) Ltd. Subsidiary of Petroleum Concessions Ltd. (IPC). Concession covers onshore and lands of a group of small shaikhdoms, about 6,000 square miles.

TRUCIAL COAST—OFFSHORE

Abu Dhabi Marine Areas Ltd. Ownership: British Petroleum Co. Ltd., 66-2/3%, Cie Francaise des Petroles, 33-1/3%. Concession covers continental shelf in Persian Gulf beyond 3-mile limit offshore from Abu Dhabi, area about 12,000 square miles.

Dubai Marine Areas, Ltd. Expires 2012. Area: Continental shelf area offshore from Dubai beyond 3-mile limit. Ownership: British Petroleum Co., Ltd., 6.2/3%; Compagnie Francaise des Petroles, 33-1/3%.

YEMEN

American Overseas Investment Corp. Area: 10,000 sq. mile area on the northwest coastal plain and off-shore coastal waters. Ownership: U. S. group from Louisiana and Texas.

World Petroleum, 604 Fifth Avenue, New York 20, New York, at $5.00 per copy.

Printed in U.S.A.

How a "Wedding Band"...

gives double strength to

AMERICAN IRON

Flash Welded Tool Joints!

An induction coil or "Wedding Band" is a new strengthening process used by American Iron for heat treating their Flash Welded tool joints at the weld line.

The induction coil heats the weld line and the heat affected areas from flash welding, to approximately 1700 degrees in a very short time.

This process improves the physical properties of the material by refining the grain size which has been enlarged during the weld cycle. It causes a "wedding" of the grain structures across the weld interface. There is no longer a weld line . . . but now a ductile, strong weld zone.

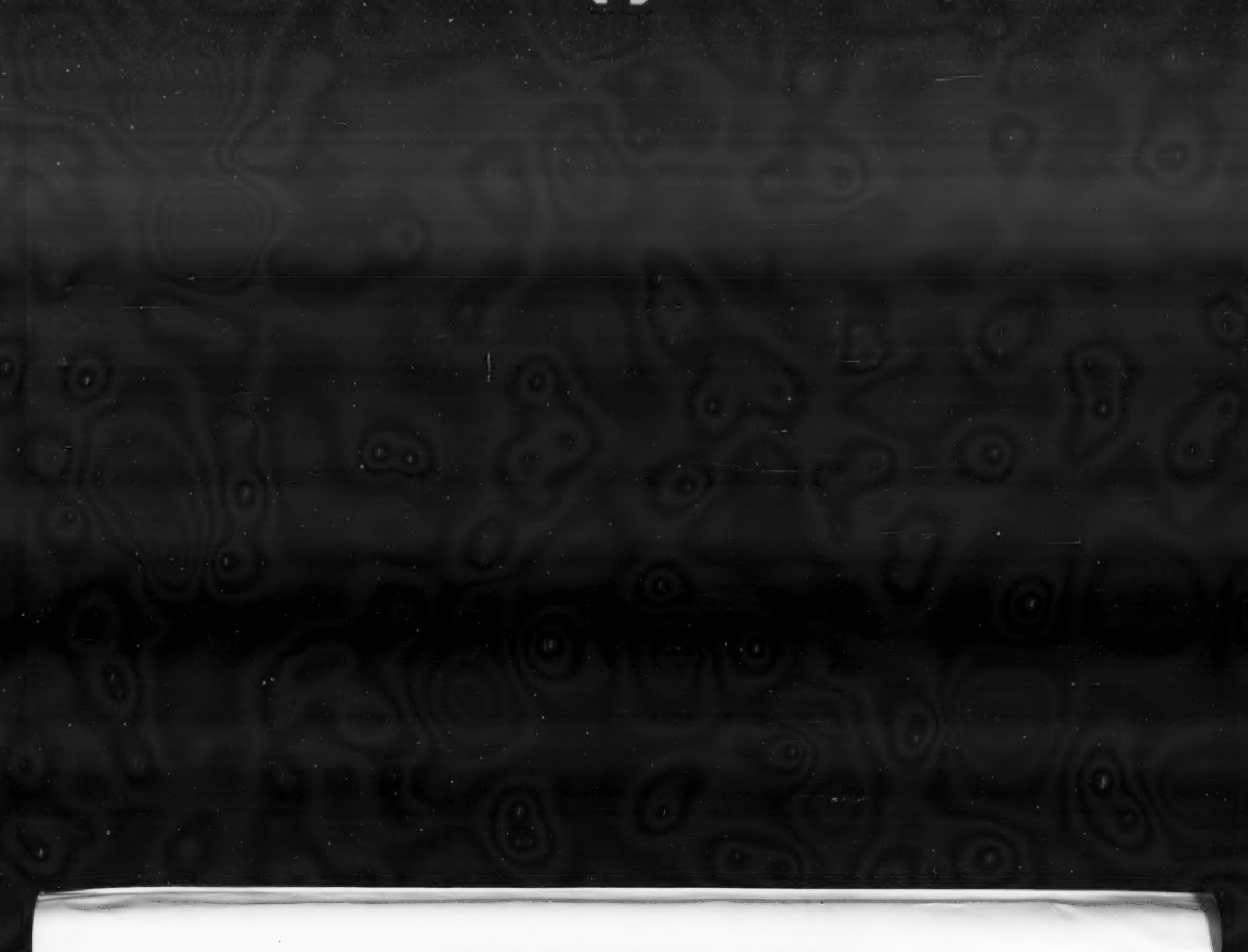
The entire heat-treating process more than doubles the tensile-impact strength of the Flash Welded connection. This is just one of the many exacting processes and tests used at American Iron in the manufacture of tool joint-to-pipe connections. Another reason why you buy QUALITY when you specify AMERICAN IRON.

Specify Flash Welded OPEN-HOLE *Tool Joints for your Lightweight Drill Pipe*

AVAILABLE THROUGH YOUR SUPPLY STORE

THESE SAMPLES ARE ON THEIR WAY to the Dowell Laboratory. They're from a problem well that could be yours. The Dowell engineer will request a quick and complete analysis. The Customer Service Section of the laboratory will go right to work to furnish a written report of the facts. Combining the lab findings with his knowledge of local conditions and your specific well problem, your Dowell engineer can recommend the best treatment. Not every well problem requires a Lab report, of course. But when you *need it,* Dowell *has it.* These research facilities, this desire to dig deep, are more reasons why Dowell gives you the most value per treatment dollar. Dowell, Tulsa 1, Oklahoma.

Services for the oil industry

DOWELL

DIVISION OF THE DOW CHEMICAL COMPANY